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FORMERLY

AMERICAN GAS LIGHT JOURNAL

VOL. CVI., NO. 3
WHOLE No. 3071

NEW YORK, SATURDAY, JANUARY 13, 1917

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MANAGERS OF SMALL GAS WORKS

should look into the question of installing

DESSAU VERTICAL RETORTS

They are built as small as 175,000 cu. ft. per day.
The Investment Cost is low and there is obtained:

HIGH GAS AND AMMONIA YIELD,
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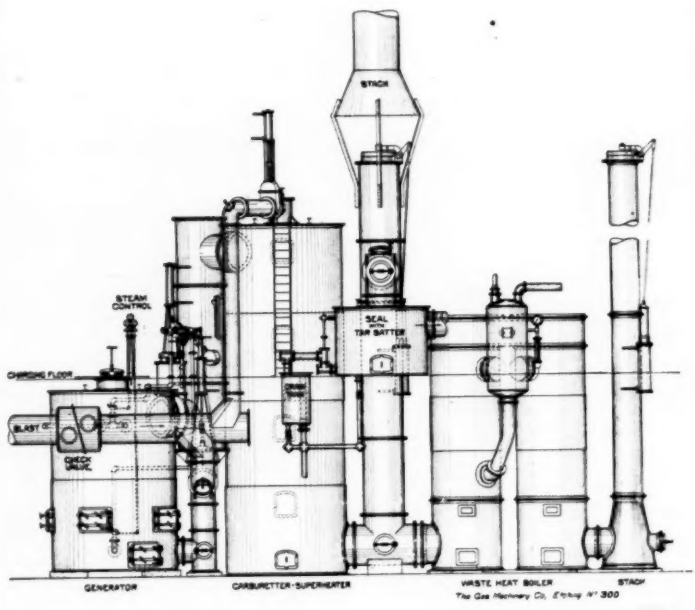
LOW LABOR COST.

WATER GAS CAN BE PRODUCED IN THE RETORTS

Resulting in high yield of standard B. T. U. gas.

THE UNITED GAS IMPROVEMENT CO., Philadelphia,

would be glad to take it up with you.



Carburetted Water Gas Apparatus

with Carburetter - Superheater and Patented Waste Heat Boiler

Advantages:

Smaller Ground Area
Less Radiating Surface
Reduced Back Pressure in Machine
Increased Efficiency

The Gas Machinery Co.
CLEVELAND OHIO

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Tests Demonstrate Adaptability of Gas to Melting of Soft Metals

One Process of Heating Lead for Electrotype Work Described—Consumption of Gas Per Pound of Lead Given

By HENRY L. READ
Engineering Department, Surface Combustion Company, Long Island City, N. Y.

A large field for the use of gas, that of late years has been developed more and more by progressive engineers, is in the melting of type metal. Owing to the low operating cost of coal-fired furnaces for this purpose and their simplicity and reliability, substantial headway has often been difficult. Several fairly satisfactory appliances have been put on the market, but in the main this business has been handled by placing blast burners on the grates of apparatus designed originally for the consumption of coal. The disadvantages of this are obvious.

One branch of this business, the heating of metal for electrotype work, has recently had surface combustion adapted to it just as it has been to other phases of the soft metal melting industry. From the designer's point of view, little variation from accepted procedure was required other than certain changes in dimensions to accommodate the "pans." These, of course, have to be capable of insertion into the pot which consequently must be properly shaped. Experience has shown that a rectangular pot about 33 by 23 by 7-in. inside measurements, gives many advantages. Aside from the structural alterations necessary to support such a vessel, the design of a Surface Combustion Furnace for the purpose under discussion differs in no essential from that of the more usual circular devices from which melted lead is removed by dipping, by pumping, or by opening a gate connected to the lower part of the container.

In Fig. 1 is shown a photograph of an electrotype pot installed in the plant of a large company in New York City. It will be seen that the three burners visible are fed from pipes dropping vertically down and running back underneath the appliance where they join the main mixture pipe by crosses, from the opposite branches of which corresponding risers lead to three burners on the far side. This main mixture pipe is supplied from the inspirator throat partly hidden by the leg of the furnace in the foreground and the inspirator body beside the leg. Gas reaches the body through the 1-in. pipe on the floor in front of the appliance and air, under about 1¼ lb. per square inch, through the 1½-in. line coming from behind and leading up over

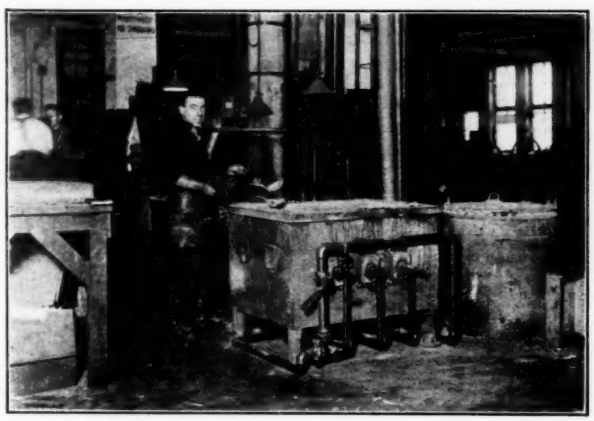


FIG. 1. ELECTROTYPE POT INSTALLED IN LARGE NEW YORK PLANT

the burners and then down vertically through a cock. This air cock is the means of controlling the mixture since, in this system of gas application, the gas is automatically proportioned to the air. In other words, when the air valve is opened wider more gas enters with the increased amount of air, and as the air valve is closed down, less gas is admitted. The correct amounts of gas and air for complete combustion without excess of either is always passed, with the volume of the mixture depending on the position of the air cock.

Figs. 2 and 3 are sectional drawings of the same furnace. The details are self explanatory for the most

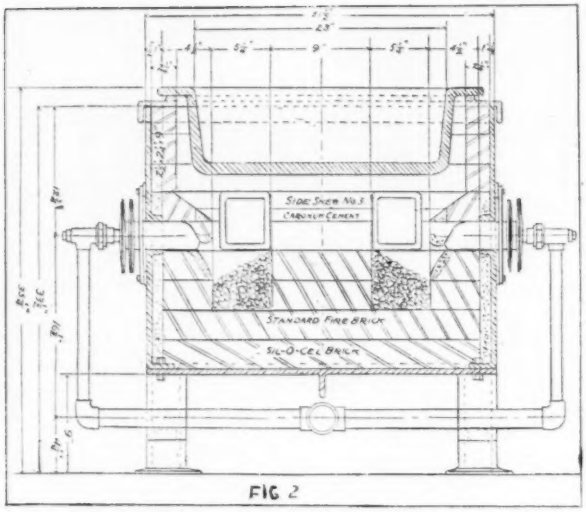


FIG. 2. BURNERS AND REFRACTORY BED ARE SHOWN IN UPPER PART OF DIAGRAM

part. In Fig. 2 the burners and refractory bed are shown along with two rectangular openings in the upper part which are lighting holes.

At the time of installation of the above furnace, some tests were run to demonstrate to the consumer the economy of operation. These are summarized as follows:

Temp.	Cold lead added per hr.	Hot lead returned per hr.	Total lead per hr.	No. of pans per hr.	Cu. ft. gas per hour.	Duration of test.	Lbs. lead per cu. ft. gas.
750 deg. Fahr.	451 lb.	271 lb.	722 lb.	12	250	2 hrs. 13 min.	2.89
730 deg. Fahr.	162 lb.	382 lb.	544 lb.	13	200	3 hrs. 43 min.	2.72

Three tests were then run to determine the amount of gas required to maintain given temperatures with no work being done.

Temperature	Cu. ft. gas per hr.	Duration of test.	Wt. lead in pot.
850 deg. Fahr.	100	30 minutes	1000 lb.
835 deg. Fahr.	95	51 minutes	1800 lb.
750 deg. Fahr.	70	30 minutes	1650 lb.

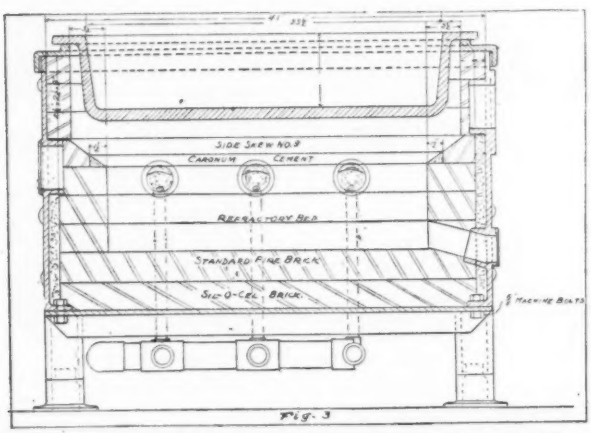


FIG. 3. ANOTHER SECTIONAL VIEW OF THE SAME MELTING FURNACE

Employee Training the Key to Success in Commercial Department of Gas Company

Efficiency Factor in Management the Ratio Between Actual Business Obtained and Possible Business Obtainable

The efficiency factor in management is the ratio between the actual business obtained in a year and the possible business that should be obtained, is the judgment of the Board of Educational Control of the National Commercial Gas Association—Lee Galloway, chairman—as expressed in its report at the last annual convention. Some managers by harsh methods may increase their business in any year over that obtained in the previous year, but that is no true measure of their efficiency. Each year's business may have been far below what it ought to have been.

A manager who does a one-million-dollar business more than last year's business of one million dollars is not 100 per cent efficient if the market for gas shows that two million dollars more of business should have been done. Under such conditions, this manager is only 50 per cent efficient.

The test of efficient management in the commercial department is coming under the same regulation as that provided for the production manager.

The latter no longer looks upon the enlargement of his plant or the crowding on of more men and machines as the only way in which to raise the "use factor" of his time and space elements. He gains higher efficiency today by speeding up his machines, routing his work, planning his operations and teaching his men how to do more work with less effort.

The commercial manager must now begin to do the same thing. Instead of spreading out over more territory, he must work the territory which he has more intensively. It is often more profitable for him to study out the uses of the floor space which is already at his disposal than to add another room or move to another corner. Instead of hiring more salesmen or more clerks, he may find it more profitable to raise the "use factor" of his territory, of his sales rooms, of his show windows and the accounting and office spaces by training his salesmen, accountants and other office men how to use the company's time and space to better advantage.

There is no use in trying to dodge this issue of training the employee. The time has come when the manager must meet face to face the problem of developing a permanent basis for his selling and office organization.

A "near" farmer, with one mule and a club, can make a living on 160 acres of ground but it takes a real farmer to run a farm in accordance with the modern standards imposed by tractors, fertilizers and produce market quotations.

Intensive farming through crop training is the key to success in that line. Intensive management through employee training is the key to successful business building in the commercial department of a gas company.

Home-Made Pipe Burners of Blast Type Used for Singeing Cloth at Concord, N. C.

John S. Palmer Describes Apparatus Used to Supplant Gasoline for Purpose Indicated—Month's Gas Consumption at One Mill 40,600 Cu. Ft.

In Concord, N. C., some of the largest cotton mills in the South are located. Three of these mills, namely, Gibson Mfg. Company, Locke Cotton Mills Company, and Kerr Bleaching & Finishing Works, were using gasoline for the purpose of singeing cloth.

John S. Palmer, superintendent of the Concord Gas Company, after finding gasoline was being used for singeing, immediately got in touch with the heads of the mills and explained to them why gas would be more economical and satisfactory than gasoline and in this way replaced the gasoline burners with gas.

The burners installed are home-made pipe burners of the blast type, made from a piece of 1¼-in. black pipe about 42-in. long, one end being capped with a continuous slot cut in pipe about 1/64-in. wide and 36-in. long.

There are four of these burners to each singeing machine, about 2 ft. apart, each burner being provided with a filler that fits into the slot, making the flame any length desired. For instance, in singeing 27-in. cloth, with burner slot 36-in. long, the fillers are inserted at each end of slot, and length of flame made equal to width of goods to be singed.

Each burner is also provided with independent gas and air valves, which are operated with one lever, which is connected with the belt shift lever.

The instant the machine is put into motion the gas valves are all opened at the same time and burners lighted from a pilot provided for each burner.

The amount of gas consumed by the machines depends largely on the kind and width of goods singed, as some fabrics require singeing only on one side, while others require it on both sides. Cloth is singed at the rate of 28,000 yards per day one side. The machine requires very little attention on the part of the operator.

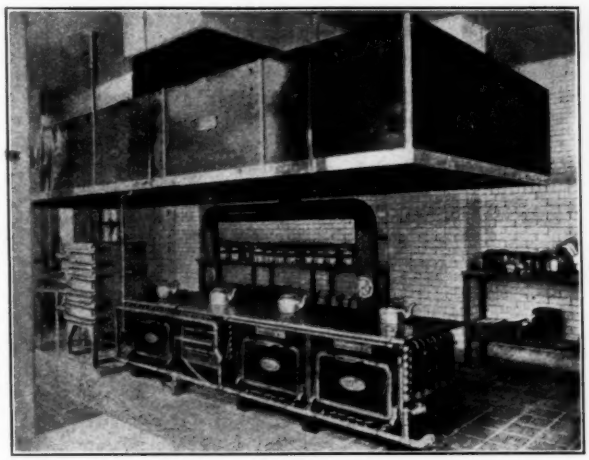
In putting through 336,000 yards of 32-in. ginghams for one month gas consumed was 40,600 cu. ft., amounting to $60.90, less $13.80 discount, as per rates given for quantity used. In singeing the same amount of goods with gasoline the gas producing apparatus consumed 510 gal. of gasoline at 18½ cents per gallon, amounting to $94.35, which shows a saving of $47.25 for one month's work in favor of gas.

The gas rates to the mills for quantity used are as follows:

First 5,000 cu. ft.	$1.50 per M.
Second 5,000 cu. ft.	1.35 per M.
Third 5,000 cu. ft.	1.15 per M.
Fourth 5,000 cu. ft.	1.05 per M.
All over 25,000 cu. ft.	1.00 per M.

The Gibson Manufacturing Company claims gasoline would have to be 16 cents per gallon to compete with gas.

In addition to using gas for singeing, the company has recently installed at one of the mills a large blast burner, with an hourly gas consumption of 600 cu. ft., its use not being disclosed at the present time.



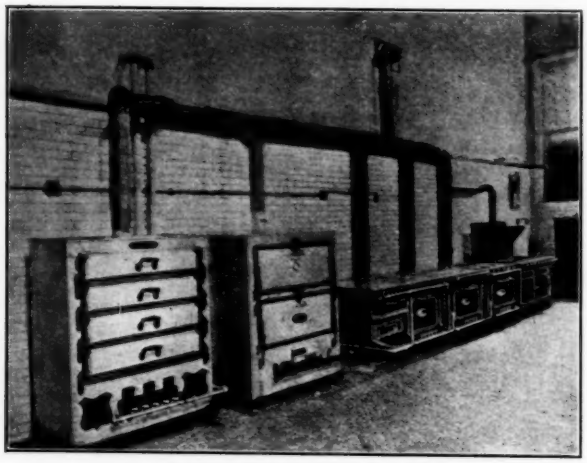
ROYAL VICTORIA HOSPITAL USES 5,000,000 CU. FT. OF GAS ANNUALLY

Montreal Company Finds Hotel Restaurant and Institution Installations Amply Worth While

Gas Consumption Totals 115,428,000 Cu. Ft. of Gas Per Year; an Average of 454,441 Per Consumer—No Claim Made as to Gas Being Cheapest Fuel

The gas consumed for cooking purposes by hotels, restaurants and institutions constitutes an important part of the output of the Montreal (Canada) Light, Heat & Power Company. C. D. Slimpin cites the following lists of consumers and indicates the total gas consumed by each per year:

Name	Cu. Ft. Per Year
Ecole St. Philomene	150,000
Maisonneuve Church	150,000
S. Paul (Restaurant)	150,000
Place Viger Hotel	1,000,000
Windsor Station Lunch Room	720,000
St. Etienne School	160,000
Christian Bros. School	180,000
Champlain School	300,000
Residence des Soeurs	150,000
St. Bridget's Academy	170,000
St. Eusebe School	160,000
St. Patrick's School	130,000
St. Antoine Academy	150,000
St. Joseph's Academy	180,000
St. Zotique College	150,000
E. Florikas (Restaurant)	200,000
P. Jarvis (Restaurant)	240,000
D. Capris (Restaurant)	180,000
C. Sevis (Restaurant)	300,000
Crown Cafe	120,000
Inst. des Freres da la Charite	500,000
Maisonneuve School	300,000
Montreal General Hospital	3,800,000
Soeurs de la Misericorde	200,000
Female Jail	1,500,000
St. Clement School	200,000
Emil Delisle (Restaurant)	240,000
Club Canadien	180,000
Maisonneuve College	100,000
St. Denis School	240,000
Les Com. des. Ecoles	360,000
St. Bridget's School	180,000



ROYAL VICTORIA HOSPITAL INSTALLATION

N. Mellies (Restaurant)	144,000
Sisters of Notre Dame de Lourdes	250,000
Notre Dame Hospital	1,300,000
C. Vidricaire (Restaurant)	130,000
St. Mary's Convent	500,000
Dominion Park	200,000
A. Pigeon (Restaurant)	144,000
W. Methot (Restaurant)	160,000
Presbytere du Sacre Coeur	350,000
E. Marion (Restaurant)	150,000
K. Bittas (Restaurant	100,000
Hinton Cafe	70,000
F. Vito (Restaurant)	120,000
L. Delios (Restaurant)	180,000
H. Rayment (Restaurant)	300,000
Immaculate Conception College	400,000
P. Beitcher (Restaurant)	300,000
Sisters of Providence	400,000
Soeur Marie David	160,000
Academie St. Francois Xavier	150,000
M. J. Lecuyer (Restaurant)	250,000
S. Michel (Restaurant)	720,000
H. Pulos (Restaurant)	120,000
P. Fay (Restaurant)	200,000
G. Geolos (Restaurant)	144,000
Fong Man Yen (Restaurant)	200,000
St. James Church	180,000
Soeurs de la Providence	300,000
Young Chong (Restaurant)	250,000
Gauveau & La Rose (Restaurant)	180,000
Z. Demetre (Restaurant)	120,000
Chalmers House Settlement	150,000
Soeurs de la Providence	480,000
Hospice Gamelin	180,000
Congregation de Notre Dame	180,000
C. Coillas (Restaurant)	144,000
Georges & Miekes (Restaurant)	144,000
Academie St. Denis	200,000
Laval University	300,000
Hong Kong (Restaurant)	120,000
Orphelinat St. Alexis	170,000
H. Desormeaux (Restaurant)	250,000
Deaf & Dumb Institute	500,000
St. Justin Hospital	150,000
H. Rabin (Restaurant)	100,000
Enfant Jesus Presbytere	200,000
Maison Jean Prevost	144,000
Les Soeurs de la Misericorde	150,000
C. Kegoris (Restaurant)	220,000
E. Barsalou (Restaurant)	350,000
Capital Lunch	500,000
Eureka Cafe	250,000
National Lunch	800,000
Model Lunch	1,260,000
M. McDonald (Restaurant)	360,000
White Star Cafe	160,000
White Palace Cafe	140,000
Mosseau Cafe	200,000
C. Spector (Restaurant)	100,000
H. Leiber (Restaurant)	250,000
L. Bachaud (Restaurant)	180,000
Monastere Prov du Bon Pasteur	1,800,000
Club St. Denis	150,000
St. Paul's Hospital	240,000
P. Beitcher (Restaurant)	300,000
Sisters of Providence	400,000
Soeur Marie David	160,0
Academie St. François Xavier	150,000
M. J. Lecuyer (Restaurant)	250,000
S. Michel (Restaurant)	720,000
H. Pulos (Restaurant)	120,000
P. Fay (Restaurant)	200,000
G. Geolos (Restaurant)	144,000
Fong Man Yen (Restaurant)	200,000
St. James Church	180,000
Soeurs de la Providence	300,000
Young Chong (Restaurant)	250,000
Gauvreau & La Rose (Restaurant)	180,000
Z. Demetre (Restaurant)	120,000
Chalmers House Settlement	150,000
Soeurs de la Providence	480,000
Hospice Gamelin	180,000
Congregation de Notre Dame	180,000
C. Coillas (Restaurant)	144,000
Georges & Miekes (Restaurant)	144,000
Academie St. Denis	200,000
Laval University	300,000
Hong Kong (Restaurant)	120,000
Orphelinat St. Alexis	170,000
H. Desormeaux (Restaurant)	250,000
Deaf and Dumb Institute	500,000
St. Justin Hospital	150,000
H. Rabin (Restaurant)	100,000
Enfant Jésus Presbytère	200,000
Maison Jean Prevost	144,000
Les Soeurs de la Misericorde	150,000
C. Kegoris (Restaurant)	220,000
E. Barsalou (Restaurant)	350,000
Capital Lunch	500,000
Eureka Café	250,000
National Lunch	800,000
Model Lunch	1,260,000
M. McDonald (Restaurant)	360,000
White Star Café	160,000
White Palace Café	140,000
Mosseau Café	200,000
C. Spector (Restaurant)	100,000
H. Leiber (Restaurant)	250,000
L. Bachaud (Restaurant)	180,000
Monastère Prov. du Bon Pasteur	1,800,000
Club St. Denis	150,000
St. Paul's Hospital	240,000
P. Manolakis & Co	120,000
Northeastern Lunch	1,300,000
Northeastern Lunch	240,000
Northeastern Lunch	1,000,000
Northeastern Lunch	1,200,000
Northeastern Lunch	1,200,000
Northeastern Lunch	2,200,000
Northeastern Lunch	600,000
Northeastern Lunch	100,000
Cardin & Sims (Restaurant)	300,000
W. Walker (Restaurant)	250,000
T. J. Gallagher (Restaurant)	320,000
S. Lericos (Restaurant)	200,000
Aird's Cafe	300,000
Grand Union Hotel	180,000
S. Detournis (Restaurant)	100,000

D. Ouimet (Restaurant)	100,000
Peter & Pouliglous (Restaurant)	100,000
E. Champagne (Restaurant)	220,000
D. Vramites (Restaurant)	100,000
Gilbault & Marsile Social Club	140,000
C. Fotis (Restaurant)	100,000
Senecal & Theriault (Restaurant)	200,000
St. John's School	150,000
Childs' (Restaurants)	4,000,000
Hotel Dieu	500,000
Royal Victoria	5,000,000
Montreal High School	320,000
L. Wheatley (Restaurant)	180,000
Sacred Heart Academy	300,000
N. Perreault (Restaurant)	150,000
H. H. Dale (Restaurant)	130,000
J. F. Burton (Restaurant)	240,000
Prince Hotel	150,000
M. Kennedy (Restaurant)	100,000
St. Sulpice Seminary	150,000
St. Sulpice Seminary	750,000
St. Sulpice Seminary	80,000
St. Sulpice Seminary	650,000
St. Sulpice Seminary	75,000
St. Sulpice Seminary	150,000
St. Urbain Academy	100,000
Montreal Maternity Hospital	350,000
Montreal Family Hospital	250,000
Little Sisters of the Poor	250,000
St. Margaret's Home	220,000
Technical Training School	200,000
Institut Orthopedique	320,000
McGill University	1,000,000
Mount Royal Club	700,000
Ritz Carlton Hotel	2,500,000
Sherbrooke Home Club	300,000
Congregation de Notre Dame	1,000,000
St. Joseph's Ladies' Home	360,000
Y.M.C.A.	180,000
Protestant Orphan Home	500,000
Oxford Hotel	180,000
A. Brown (Restaurant)	360,000
Wing Yon	100,000
St. Cunegonde School	150,000
A. Caramel (Restaurant)	180,000
E. Piggott (Restaurant)	200,000
Belmont Hotel	150,000
Albion Café	200,000
Tremont Hotel	200,000
V. Vincelli (Restaurant)	300,000
Alberta Hotel	120,000
N. Nicholacocas (Restaurant)	240,000
Windsor Hotel	1,500,000
Nazareth Asylum	250,000
James Lee (Restaurant)	300,000
Chelsea Hotel	250,000
Eastern Cafeteria	1,100,000
St. Regis Hotel	350,000
Jassby's Tea Room	420,000
Manhattan Restaurant	300,000
Cosy Parlor	260,000
Essex Lunch	1,000,000
Goodwins Ltd.	1,200,000
Almy's Ltd.	1,000,000
Spear's Tea Room	120,000
Palm Garden	450,000
Jassby's Tea Room	120,000
Edinburgh Café	500,000
Walton Lunch	2,200,000
Bryson Tea Room	1,000,000
Castle Blend Tea Room	350,000
Ogilvy Dept. Store	300,000
Little Green Tea Room	160,000
J. Tremblay	250,000
M. Depariron	150,000
His Majesty's Café	250,000
Jassby's Tea Room	200,000
The Royal Café	150,000
Women's Hospital	150,000
Y.W.C.A.	200,000
Royal Hotel	200,000
F. W. Maxwell	120,000
Montreal Club	300,000
Freeman's Hotel	700,000
Walton's Lunch	2,000,000
A. Callogery (Restaurant)	360,000
P. G. Demetre (Restaurant)	250,000
P. G. Demetre (Restaurant)	200,000
Canada Railway News Co.	1,500,000
Queen's Hotel	240,000
G. Sheard (Restaurant)	180,000
N. Angelopoulos (Restaurant)	120,000
A. Cadieux (Restaurant)	120,000
T. A. Trenholme (Restaurant)	220,000
Total	115,428,000

The Royal Victoria Hospital installation consists of two sections of Stewart Siphon Blast Ranges with one section of Stewart Spot Top Range; together with a Combination Griddle, Toaster and Broiler, also one No. 214 Pastry Oven and one No. 1 Meat Roasting Oven.

The Ross Memorial Hospital installation consists of two sections of Stewart Siphon Blast Range and one section of Spot Top Range, together with the Combination Griddle, Toaster and Broiler.

The St. Emelie Acadamy, at No. 51 Adam Street, Maisonneuve, has lately purchased from us three sections of Quality Gas Range and a No. 35 Ruud Heater.

The Homeopathic Hospital, on McGill College Avenue, has lately purchased from us two sections of Quality Gas Range.

The Canada Railway News Company is using two sections of Garland Hotel Range and a No. 4 Automatic Water Heater.

All these are complete All-Gas kitchens and are modern.

It will be noticed that the approximate total yearly consumption of these 254 consumers amounts to 115,428,000 cu. ft. or an average of 454,441 cu. ft. each, whereas the domestic consumer uses only about 18,000 cu. ft. per year.

Using this average of 454,441 cu. ft. as against 18,000 it will be noticed that each of these 254 consumers use as much gas as 25 of the domestic consumers.

Claim is not made that in all cases gas is cheaper than coal, wood or other fuel, but the company will go into a prospective customer's premises to study his conditions and requirements so as to show him the advantages to be derived by the use of gas for cooking, and prove, in many cases, that with the installation of modern and efficient gas cooking appliances it can save him money and make a wonderful improvement in his output and working and sanitary conditions.

House Organ Important Factor in Modern Business

There are in the United States, all told, over 15,000 business publications, written, edited and printed for the benefit of business organizations, the *Monthly Bulletin* of the National Commercial Gas Association states. Not only presidents and vice-presidents are interested, but all employees.

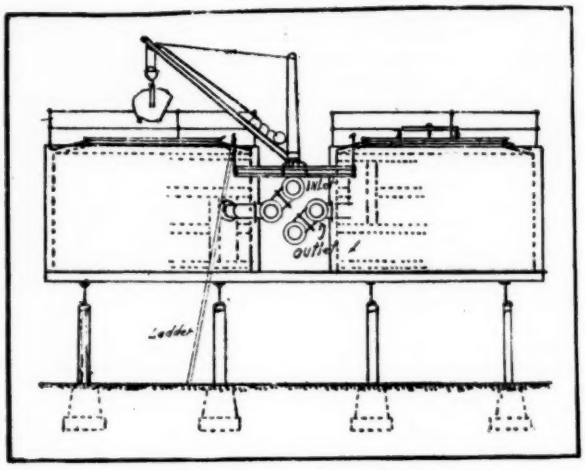
Backward Rotation System—A Scheme of Purification—Revivification at Holyoke Gas Works

O. W. Adams Tells of Experiments Made and of Latest Results Obtained

The method we use, stated O. W. Adams, superintendent of Gas Works at Holyoke, Mass., in a "Wrinkle" published in a recent issue of the Gas Institute News, consists entirely in adding enough oxygen, as air, to the gas to combine theoretically with the hydrogen sulphide present. This oxygen does not react directly with the H_2S as present in the gas, or with the sulphur-iron compound immediately present in the purifying material. To do this, the revivification reaction would have to take place in the first boxes.

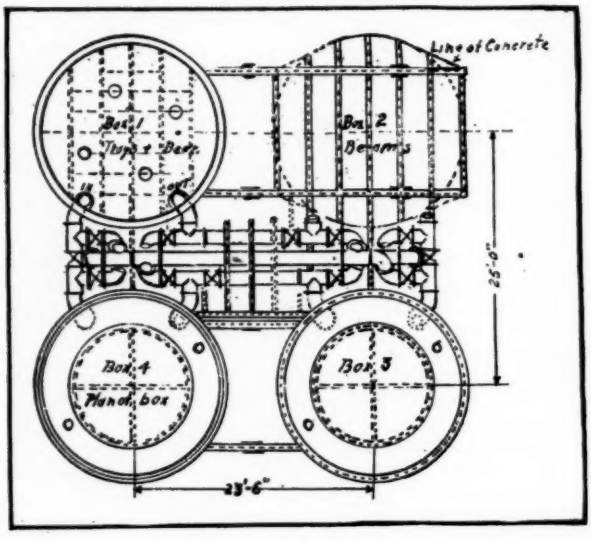
We have attempted this method, but were not successful with it. We also attempted the usual method of reversing the flow thus: 1—2—3—4 to 4—3—2—1, but in doing this, dirty gas was obtained. We gave this a two-day trial at different times, but the gas would not become clean.

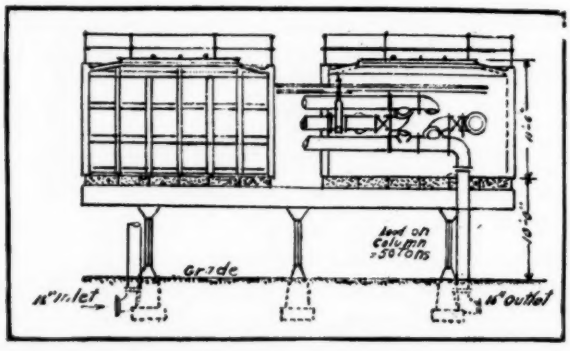
We do not doubt that this plan of revivification can be operated successfully, but know that it necessitates a clean box as a last in the series at all times to catch the dirty gas.



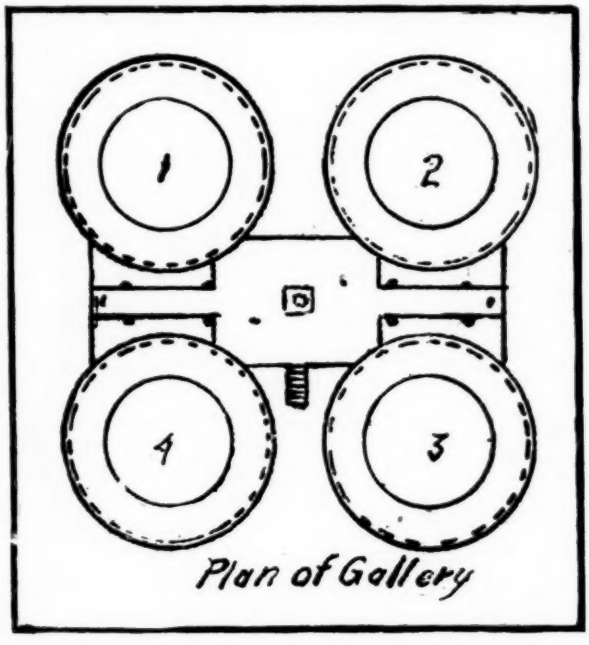
SECTIONAL VIEW OF BOXES

As we have said before, the method we use consists in admitting a certain percentage of oxygen to the gas. This oxygen apparently does not react with the material in the first or second boxes, but does react with the sulphur-iron compound in the third and fourth boxes.





DIAGRAMS SHOW ARRANGEMENT OF BOXES



SHOWS CLEARLY PLAN OF GALLERY

We started running 1—2—3—4. The gas contained 250 grains H_2S per 100 cubic feet. The outlets of the 1—2—3 showed dirty gas while No. 4 outlet was clean.

After running a week on this admixture of air the gas from No. 3 box became clean. We then changed the series to 4—1—2—3. During the week No. 2 box gave off clean gas, and after seven days, we changed to 3—4—1—2. The same is done each week and the purifying material undergoes the same changes. This system may be called the backward rotation system, and

has been in operation since June 8, 1916, and we have not had occasion to dump a box since. Of course, we do not know how long this will continue, but it would seem as if it will go on until the material is saturated with sulphur.

In case we were running straight coal gas with 400 grains of sulphur we would add at least 2 per cent. of air which would give enough oxygen to react theoretically with all the H_2S present and practically with as much sulphur as iron sulphide in the last two boxes as is being deposited from the gas in the first two boxes, the idea being to add oxygen enough at all times to keep the H_2S neutralized.

The extra amount of nitrogen does not seem to make any great difference in the candle-power of the gas, but from the table we have seen 2.8 per cent air mean a difference of about 5 per cent. in candle-power on 25 candle-power gas. We have no knowledge of the effect on lower candle-power gases or with lower percentages of air. In fact, all that seems to us necessary is to add a proper per cent. of air, change series, and then keep changing as hereinbefore set forth.

Burden of Caring for Injured Should Be Borne by Industry

C. L. Close Describes Welfare Work of United States Steel Corporation—4249 Employees Now Serving on Safety Committees

There was a time not long ago when employers paid little attention to the welfare of employees. Plants were built and machinery installed with a view to economy of space and volume of production. Little thought was given to the conditions under which employees worked. The industrial pioneers in this country couldn't consider the wear and tear on human bodies. They were too busy developing processes and striving to become leaders of the world in manufacturing, explained C. L. Close, manager of the Bureau of Safety, Sanitation and Welfare of the United States Steel Corporation, in a paper presented at the science congress, held at the American Museum of Natural History, New York City, December 28, 1916.

It is the task of the present generation to prevent accidents, to ward off disease and to promote social welfare. We shall make mistakes just as the preceding generation did, and it will fall to the next generation to correct our mistakes, as we have corrected some of the mistakes of our predecessors. The opportunity for study and experiment is much better to-day, and as we become enlightened our standards will be raised. Some things that are being done to-day, which may be considered in advance of the times, will, in a short time, be accepted as nothing out of the ordinary.

Not many years ago it was unusual for a plant to have toilet and washing facilities. To-day, no manufacturer would build a plant without including these things, as an essential part of the equipment. It is only that we are becoming more enlightened and are discovering things which those before us had neither the opportunity nor the time to discover.

Many things are being done in the corporation which may be considered innovations, and it may be that we are making mistakes, but we are just now going through the experimental stages of some of this work, and it will fall to those who come later to correct our mistakes. While in recent years some thought was given to the human side of steel making, and various attempts were made to improve conditions, there was no concerted or systematized effort until after the formation of the United States Steel Corporation.

Organization

In order to systematize and standardize the work that was being done by the subsidiary companies, the steel corporation, in 1906, appointed committees to study these matters. A safety committee was appointed, consisting of representatives of the latter subsidiary companies, who had already given some study to the subject of accident prevention. This committee now meets four times each year, conducts inspection by sending men from one company to another company's operations; studies serious accidents and recommends measures to prevent the recurrence of such accidents in any of the plants; passes upon safety devices and makes recommendations as to their use.

The good resulting from the work of this committee led to the appointment of other safety committees, including the central committee of safety for each subsidiary company, composed of representatives from the different plants of the company. Its duties are similar to those of the Steel Corporation's Safety Committee, but with reference to its particular company only.

There are also plant committees, composed of important officials of the plant—whose duties are similar to those of the central safety committee, but with reference to their particular plant only. There are also department and special committees, made up of foremen, master mechanics and skilled workmen, who investigate particular problems, and workmen's safety committees from the rank and file of the mill, including even the foreigner who cannot speak English. Their duties are to look for dangerous conditions and to recommend ways and means of preventing accidents.

Members of these committees, especially of the plant committees, are changed frequently so that in due course each man in the plant shall serve upon the committee. Up to the present some 13,000 employees have served upon these committees and there are now 4249 men so serving.

Accident Prevention

The results of the work on accident prevention have been very gratifying. Our serious and fatal accidents are about one-half of what they were in 1906. We have saved since that time 14,967 men from serious or fatal injury. Approximately, five and one-half million dollars have been spent in providing safeguards. Our efforts to-day are to educate our workmen in safer methods of work, and to warn them against certain practices that are not only unnecessary, but often foolhardy. They had come to believe that " chance-taking " was a necessary part of their work.

Recognizing the fact that with the utmost care and the protection afforded by the most approved safety devices and apparatus, accidents will occasionally happen, the subsidiary companies have made provision for prompt attention to injured men and skillful care of them.

All the mining companies of the corporation have First Aid and Rescue Crews composed of employees who are especially trained for the work. This service is purely voluntary on the part of the employees, but before any man is allowed to enter the work, he must

have a doctor's certificate showing he is physically fit for the training and labor incidental to it.

The system varies slightly in each company, but the general plan is as follows:

Four to six men are assigned to each crew. They meet periodically and are trained by the company doctor. The course consists of lectures, demonstrations and drills. Twelve lessons are usually required to complete the course, and each man is given a certificate after he has qualified. The training of the men for the work goes on continually and many new crews are added each year. A number of crews are assigned to each mine.

At many of the manufacturing plants of the subsidiary companies of the corporation, men are trained in First Aid work. The training is similar to that given in the mining companies. The primary object of First Aid is to furnish an aseptic or clean dressing that will prevent infection in the wound.

As a necessary adjunct to First Aid and Rescue Work in both mines and mills, emergency hospitals, completely equipped, have been provided in all plants and mines. All cases of injury, no matter how trivial, are sent to the emergency hospitals of stations, where treatment is given by competent surgeons or trained nurses.

Whenever the accident is of a serious nature, the injured man is taken to the emergency station, where First Aid treatment is administered, and he is then transferred to the nearest hospital.

Relief

Recognizing the fact that the burden of caring for the injured should be borne by the industry, the steel corporation established a voluntary accident relief plan, which was put into force before any such system had become law in the United States.

This plan is purely voluntary and was put into operation by the corporation in May, 1910, and is for the benefit of all employees injured and the families of employees killed in the service of the subsidiary companies.

The funds required to carry out the plan are provided by the companies, with no contribution whatever from the employees. Relief is paid regardless of legal liability and without legal proceedings; even application for relief is not required. The companies provide treatment by surgeons and in hospitals.

This plan of relief is still in effect in those states where Workmen's Compensation Laws have not been enacted. The amount paid in 1915, to and for our injured workmen, including expenditures both under our plan and Workmen's Compensation Laws was $1,694,465.29 or 85 per cent. of our total expenditures, account of work accidents, was paid out to the injured men and their families, or in taking care of them.

Sanitation

The work in sanitation has been organized in a manner almost identical with the safety organization, except that the sanitation committee is chosen from the presidents of the subsidiary companies with an officer of the United States Steel Corporation as one of its members. This committee administers the work through a sub-committee composed largely of technical representatives from each of the subsidiary companies.

In sanitation many improvements have been made in the proper investigation and observation of water supply and distribution to the employees. All sources of drinking water are analyzed periodically and great care is taken to prevent possible pollution by surface water or otherwise. The most modern sanitary methods are employed in the cooling and distributing of the water, including the installation of sanitary drinking fountains. The common drinking cup has been practically eliminated.

The common or roller towel was abolished several years ago. The committee has prepared specifications covering general sanitary requirements and these are followed by the subsidiary companies when installations are made. An important requirement in these specifications is that no wash basins shall be installed. Facilities for washing the face and hands must be such that employees must necessarily wash from the flowing stream. This may seem radical, but we think it important, to avoid any possible danger of spreading disease. Good toilet facilities have been installed at many plants and mines—these facilities usually including shower baths. A number of swimming pools have been built for the general use of the people in the mining towns.

Gardens

In order to promote more healthful and pleasant living conditions, the subsidiary companies owning houses in which their employees live, have offered prizes each year for the best vegetable and flower gardens. Last year there were 6963 of these gardens in the Frick Coke Company towns alone—95 per cent. of the total number that could have been planted. The estimated average value of each vegetable garden was $21.48, based upon the prices at which garden produce was sold by the stores in that vicinity. There were 6633 vegetable gardens and this meant a saving to the employees of that company of $142,536.21.

To further encourage thrift, The Tennessee Coal, Iron & Railroad Company in Alabama, where, because of the long season, a large proportion of its employees have mid-summer gardens, now offers prizes for the best gardens inspected in October. The climatic conditions in Alabama are more favorable to fall gardens than in any of the other localities in which our plants or mines are situated.

Some of the companies have utilized the vacant land near their plants for community gardens. The ground is usually plowed at the expense of the company, and is then plotted and turned over to the employees for their use. Prizes are offered for the best gardens. Usually the amount of land allotted is insufficient to accommodate all those who desire to cultivate these plots.

Clubs

Many of the subsidiary companies have provided commodious and well equipped club houses for the use of their employees, members of their families and friends. The features are:

Dormitories, reading room and library, gymnasium and swimming pool, baths (tub and shower), auditorium and dance hall, billiard and pool rooms, bowling alleys, basket ball halls with motion pictures, lectures, concerts, smokers, musicals, etc.

The subsidiary companies pay all taxes and insurance and furnish heat. All other expenses are borne by the club members, the initiation fees and monthly dues

being very small. In some cases these dues are fixed in proportion to the wages of the men.

Reading rooms are supplied with the current magazines and periodicals, daily papers and a good assortment of books. The social entertainments are a feature of the clubs. The affairs of the clubs are handled by the members themselves in the usual way. Intoxicating liquors and gambling are prohibited.

Stock Subscription Plan and Pensions

On December 31, 1915, more than 40,719 employees were stockholders under the Stock Subscription Plan inaugurated in 1903. Their aggregate holdings are more than 178,898 shares of a par value of $17,889,800. It is impossible to ascertain how many employees, in addition to those yet receiving the special benefits that continue for five years, hold stock upon which these special benefits have ceased to be paid, but it is believed that the number would greatly increase these figures.

The United States Steel and Carnegie Pension Fund, which was established in 1910, by the joint action of the United States Steel Corporation and Andrew Carnegie, had a record of 9002 pensioners on December 31, 1915. The amount paid in pensions during 1915 was $659,389.42.

Welfare

In welfare work of a character not already mentioned for the benefit of the workmen, the subsidiary companies are trying many interesting experiments, some of which have already proved very successful, and it is hoped that the others will be equally successful so that the work may be further extended.

One of the most practical and successful of the new departments developed in connection with the welfare movement is that devoted to gardening and nature study. This department was inaugurated at the Duquesne Works of the Carnegie Steel Company during the summer of 1914, and the results were most encouraging. The principal gardens were conducted in connection with the Water Street Playgrounds. Here a number of old houses were removed, and the area vacated was apportioned into 144 small plots of 8 x 10 ft., and each plot allotted to a boy or girl. The children, aged 8 to 14 years, and representing ten different nationalities, were under the direction of a trained instructor and were given daily lessons in garden making.

Each garden was planted with beans, beets, carrots, radishes and lettuce; and the actual labor of planting and caring for the gardens was performed by the children themselves. The little gardeners utilized the crops for home consumption, or sold them and used the money for their own purposes. In addition to the regular care of the gardens, the children study the germination of seeds. First, the development of the seedlings, showing the transformation of the dry seed into a living plant, which breathes, eats and grows just as human beings do. This gives an insight into the wonders of the living world, satisfies the natural curiosity of childhood and affords much pleasure.

Study of methods of planting is also insisted upon. The children are taught the necessity of a knowledge of the life and habits of the plant and are shown the results of right and wrong planting. Methods of cultivation are touched upon, and the result of each method is shown. Methods of fertilization follow in succession with demonstrations of the results of each method and practical advice as to the proper method to be selected. Then comes the study of systems of irrigation and the conservation of soil water, showing the means employed and the effects produced. This is followed by study of the various functions of the plant.

Visiting Nurses

Visiting nurses are employed by the companies in a number of districts. Ordinarily they are under the direction of the local company physician or plant manager, although in some cases they are under the supervision of city visiting nurses associations. Their duties are to visit the homes of employees, especially where there is sickness and the family would be benefitted by the assistance or instructions of a trained nurse; to render such aid as will conduce to the comfort and welfare of the families; to instruct and direct mothers in the care and feeding of infants.

These nurses explain the proper preparation of all food and advise in the matter of economical purchasing, discourage anything and everything tending to immorality, and teach the value and necessity of cleanliness and the benefits of fresh air and sunshine.

Some of these nurses have been provided with a house which we call a "Practical House Keeping Center"—a house of the ordinary type in the locality, furnished in a manner not beyond the means of the lower paid workmen, but in a better style than they had been accustomed to before coming to this country.

This house is used as the nurse's headquarters. Here she conducts classes and teaches the women and girls in the neighborhood the art of housekeeping in a practical and sanitary manner.

Playgrounds

One hundred and thirty-seven playgrounds for children have been provided by the subsidiary companies. In most cases they are on the company's unused land, and in some cases they are on city or private property, but the grounds are usually prepared and equipped at the expense of the company. Competent instructors employed by the company are in charge of the grounds. In addition to playground work, some companies provide instructions in sewing, basketry and handicraft. Motion pictures, both for instruction and amusement, are shown at night to parents as well as the children. Last summer there was a daily average attendance of 18,000 children at these playgrounds. Where these grounds are installed, it is immediately apparent that the standards of the children are raised. It is impossible to over-estimate the influence for good exerted by these recreation features on the future lives of the boys and girls of the community in which they are located.

Educational Work

For many years the companies have been carrying on educational work among their employees, including vocational training and apprenticeship classes, and the teaching of English to foreigners. The purposes are:

To increase the efficiency of the workmen by teaching the fundamental and the more advanced principles involved in their individual lines of work.

To increase the earning power of the pupils by guiding them along the paths of quicker and deeper reasoning which lead to positions of gradually increasing responsibility in all departments of the mill.

To promote and develop the happiness of the pupils not only in their daily work in the shops and mills, but

in their home life as well, by opening the door to a more thorough understanding of the meaning of life and work.

The courses are varied to meet the needs of every employee who is desirous of advancement, whether he is the graduate of a university or a man who has had no special school advantages. The teachers are men actively engaged in their respective lines either in the mills or in the city. These men are selected because of their scholarship and broad practical experience in the branches they teach. The majority are assistants or foremen in the various departments of the mills, and, therefore, are personally acquainted with many of the students in their classes, which results in an increased mutual benefit.

Actual mill problems are considered and studied in each step of the work as it is taken up in the prescribed courses, with the result that each pupil not only learns the principles involved in his own special line of work, but also those that must be understood before he is qualified for the position ahead.

Special and attractive inducements are offered to those who finish the courses.

The method of teaching English to the foreigners is usually that recommended and used successfully by the International Committee of the Y. M. C. A. in various industrial localities. The majority of the foreigners upon entering the school cannot speak, read or write the English language. They are first taught simple English sentences and the names of objects with which they come in daily contact; then follows instruction in letter writing, and the filling out of money order blanks and naturalization papers.

They are taught the elements of civil government; and the plan of the county, state and national governments, their departments, and the names of important officers and offices are carefully explained to them. The advanced pupils are taught writing, spelling, grammar, composition, civics and arithmetic; books on American history and geographical readers are used as text books.

Fundamental Principles Involved in Valuation of a New Property Different from Those in an Old One

The fundamental principles involved in the valuation of a new property are necessarily different in some respects from those involved in the valuation of an older one, because a new property, which has not begun to earn or to have the value of its parts affected by appreciation or depreciation, stands in a different position from an old one which has been in operation and earning for many years, and has many parts which may have appreciated or depreciated in value, states the Special Committee to Formulate Principles and Methods for the Valuation of Railroad Property and Other Public Utilities of the American Society of Civil Engineers on page 1734 of its report as published in the December proceedings of that Society. Moreover, in the case of an old property, valuable property or rights may have been acquired or lost, without the payment or receipt of money therefor, as a result of time or through the failure of the public or the owner of the property to assert their authority. Property or rights so gained or lost affect the valuation materially, and a failure to recognize them would be inequitable to the present owners of the property and to the public.

Indianapolis Company Contemplates Further Extensive Improvements

The Citizens Gas Company of Indianapolis has announced a novel method of selling $250,000 worth of its capital stock. The sale is to be held by public auction Feb. 5. This method of selling stock, however, is in accordance with the franchise and articles of incorporation of the Citizens Gas Company. Whenever it desires to increase its capital by the sale of stock, it must sell to the highest bidder at a public auction, to be held after due notice and any premium which is obtained must be carried as a permanent surplus of the company, on which dividends are not to be paid in any form. The last issue of new stock by the Citizens Gas Company (which was merged with the old Indianapolis Gas Company, under a lease approved by the Public Service Commission of Indiana some years ago, thus giving the Citizens Company a monopoly of the Indianapolis field) was on Jan. 27, 1913, when the company sold $200,000 par value of its stock at a premium of 51 per cent. At that time it was announced that it was the expectation of the company not to offer any additional stock to the public for at least two years.

J. D. Forrest, general manager of the plant, said:

"The Citizens Gas Company has made very extensive enlargements and extensions to its plants and distribution system since the beginning of 1916, and further extensive improvements are contemplated for the present year. The growth of the city and the increasing demand for the company's products require constant enlargements of its capacity for manufacturing, and constant extensions to its system of gas mains. All of the improvements that have been made since Jan. 1, 1916, have been financed out of earnings, working capital and other temporary devices, and it is now proposed to reimburse the treasury by the sale of stock. On account of the uncertainties of the future, it has been deemed by the directors of the company a wise policy to provide at this time as ample capital as possible in order to enable the company to keep up with all of the requirements of its business, even if there should be a very unfavorable financial situation after the close of the European war.

"The demand for the company's stock is very strong. The stock is non-taxable in this state and is also free from the normal Federal income tax. The company is paying regular dividends.

"The report of the year's business is not yet completed, but will be ready for distribution by the time named for the sale of the stock. It is known, however, that the year has been a prosperous one, and it is also known that we have spent a very large amount of money on improvements to our property during the last year.

"Among the improvements now contemplated, aside from the matter of main extensions, the most important is the construction of an additional gas-storage holder. The company does not, at this time, contemplate the enlargement of its coke oven plants, but if the growth of the city continues it will not be many years before it will be necessary to construct additional by-product coke ovens.

"The improvement of the Langsdale Avenue plant and to the distribution system, leased from the Indianapolis Gas Company, are largely financed by the sale of bonds of the Indianapolis Gas Company, and not by the Citizens Gas Company's own securities.

"In addition to the constant enlargement of the leased property, the property owned by the Citizens Gas Com-

pany is constantly undergoing enlargement and improvement, both to meet the increasing demands of the city for gas, and to take advantage of opportunities to bring down the cost of operation of the plant or to engage in new industries, such as the company has taken up during the last two years. The property has been maintained in the best possible condition."

The Citizens Gas Company, of Indianapolis, from its formation by a group of citizens several years ago, has been extremely successful and its annual earnings have shown remarkable growth, although it is limited to 55-cent gas as the maximum charge, through the terms of the lease of the Indiana Gas Company's plant, approved by the state commission.

Gas-Caused Fires Relatively Few

Classed as Strictly Preventable—Electrically-Caused Fires in Three States Several Times Greater

After collating and analyzing the details of a very large percentage of all fires in New York, the Actuarial Bureau of the National Board of Fire Underwriters has ascertained the causes of these fires, for the year 1915, with their relative losses, to have been as follows:

STRICTLY PREVENTABLE CAUSES

		Per cent.
Defective chimneys and flues	$826,997	4.1
Fireworks, firecrackers, etc	32,506	0.2
Gas, natural and artificial	138,209	0.7
Hot ashes and coals	42,323	0.2
Ignition of hot grease, oil, tar, wax, asphalt, etc	74,170	0.4
Hot or molten metal	5,634	0.0
Matches	867,728	4.3
Open fires	95,005	0.5
Open lights	230,742	1.1
Petroleum and its products	234,633	1.2
Rubbish and litter	44,609	0.2
Smoking (cigars, cigarettes, pipes, etc.)	801,582	4.0
Steam and hot water pipes	95,005	0.5
Stoves, furnaces, boilers and their pipes	869,475	4.3
Total	$4,358,618	21.7

PARTLY PREVENTABLE CAUSES

		Per cent.
Electricity	$935,413	4.7
Explosions	312,871	1.6
Exposure	2,861,090	14.3
Incendiarism	593,107	3.0
Lightning	389,796	1.9
Miscellaneous, cause known but not classified	264,246	1.3
Sparks—from fires	221.023	1.1
Sparks—from machinery	173,271	0.9
Spontaneous combustion	619,690	3.1
Total	$6,370,507	31.9
UNKNOWN CAUSES (Probably largely preventable)	$9,346,286	46.5

New York makes an interesting comparison with the neighboring States of Pennsylvania and New Jersey in the various causes cited.

STRICTLY PREVENTABLE CAUSES

	N.Y. Per cent.	N.J. Per cent.	PA. Per cent.
Chimneys and flues	4.1	3.2	4.0
Fireworks	0.2	0.0	0.2
Gas	0.7	0.2	1.2
Ashes and coals	0.2	0.4	0.3
Grease, oil, etc	0.4	0.2	0.2
Metal	0.0	0.0	0.1
Matches	4.3	2.4	1.9
Open fires	0.5	0.2	1.6
Open lights	1.1	0.7	0.7
Petroleum, etc	1.2	0.8	0.6
Rubbish, etc	0.2	0.2	0.3
Smoking	4.0	2.4	1.9
Steam pipes, etc	0.5	0.1	0.4
Stoves, etc	4.3	3.2	4.0
	21.7	14.0	17.4

PARTLY PREVENTABLE CAUSES

	N.Y. Per cent.	N.J. Per cent.	PA. Per cent.
Electricity	4.7	3.9	6.0
Explosions	1.6	0.5	1.6
Exposure	14.3	7.0	13.5
Incendiarism	3.0	3.2	3.4
Lightning	1.9	2.5	2.9
Miscellaneous	1.3	1.9	1.8
Sparks—from fires	1.1	1.4	1.6
Sparks—from machinery	0.9	1.1	0.2
Spontaneous combustion	3.1	2.4	4.3
	31.9	23.9	35.3
UNKNOWN	46.5	62.2	47.0

By-Product Coke Production Shows Marked Increase

The coke output of the United States broke all records in 1916. More than 35,000,000 tons of beehive coke was manufactured, an increase of over 27 per cent compared with 1915, and 500,000 tons more than the record-breaking total in 1910. By-product coke amounted to 19,200,000 tons, an increase of more than 5,000,000 tons, or 36 per cent compared with 1915. The total coke production, according to estimates prepared by C. E. Lesher, of the United States Geological Survey, was 54,300,000 tons, an increase over 1915 of 12,700,000 tons, or 30 per cent, and over 1913 of 8,000,000 tons.

Fair Return on Investment a Proper Basis in Valuation in a New Property

A fundamental principle of primary importance is that a valuation shall be made so that it will be fair to all parties affected, declares the Special Committee to Formulate Principles and Methods for the Valuation of Railroad Property and other Public Utilities of the American Society of Civil Engineers on page 1734 of its report as published in the December proceedings of that Society.

So long as it is desired that public service corporations and not government shall provide the utilities required by the public, it will be necessary, in the exercise of public regulation, to use principles and methods of valuation which, when properly applied, will attract the capital necessary for building new properties, for extending old ones, and for rendering satisfactory service.

Under normal conditions, the investor is induced to create new property by the prospect of obtaining a fair return on the amount of his investment, and such investment is a fair basis for valuing such new property, but is not necessarily the "value."

Not many years ago, it was very common to value public service property by capitalizing the net earnings, and though the sum thus obtained may be a proper element for consideration under some conditions in the valuation of a property, it is manifestly not a proper basis on which to predicate reasonable returns.

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Coke

It is interesting to trace the evolution of coke manufacture and gas manufacture. In the early days all coke for metallurgical purposes was made from large coal piled in heaps with central chimneys, like those of the charcoal burner, or in open rectangular clamps or kilns with air flues in the enclosing walls. It is apparent that these methods were very inefficient. As a result they are now practically obsolete. The most common method of coke manufacture to-day is the bee-hive oven, which is also inefficient and wasteful. This gives a very good coke but does not allow the recovery of the tar, ammonia and gaseous by-products. For this reason it is now giving way to the retort method, which, although, in general, not giving quite so satisfactory a form of coke as the bee-hive oven, permits of the recovery of all by-products and results in a much more economical operation.

When illuminating gas was all made by distilling coal the resulting coke was usually more or less of a drug upon the market. Owing to the shallow retorts and the fact that the coke was produced rapidly, and at low heats, it was loose and spongy and suitable for little except domestic use. At this time there appeared to be very little connection between coke making and gas making. Each occupied a field by itself and neither benefited from the by-products of the other. With the advance of the industry, however, we find a decided tendency for the coke and the gas industry to approach one another.

To-day we find a number of coke plants selling the gas they do not require for fuel to gas companies, and we find a decided tendency in the gas industry towards the use of retorts that will result in a harder, denser coke; one that is more suitable for the purposes for which coke alone has to date served as a satisfactory fuel. Throughout the country there is now a general interest in conservation. A large proportion of the population knows that for all domestic purposes gas from the conservation point of view is by far the most efficient fuel. This means, therefore, that to conserve our fuel resources it will be necessary to get everything possible from the coal we destroy. This means that the coke business and the gas business are gradually becoming practically the same business.

It may be objected that the present coke business is a very erratic business; that it must supply a great demand when the iron and steel business is flourishing, and that it takes a decided slump with a slump in the iron and steel market.

It must be borne in mind, however, that the time is surely coming when raw coal will no longer be used for fuel; that it will always be distilled before it is burned and that the public will become so well informed in regard to the unnecessary waste attached to the burning of coal as it comes from the mines that legislation to prevent such waste is not an unlikely possibility

within the next two decades. This would mean a greatly increased demand for coke, and would also make it possible to supply an immense amount of gas from by-product coke ovens.

Since this day is surely coming it would seem wise for gas men to give the question the most serious thought, for that group which does so is certain to control the situation. As it now seems, either the coke men will control the gas industry or the gas men will control the coke industry. Which shall it be?

Fire Hazards

Again we are reminded of the negligibility of gas as a fire hazard. Statistics prepared by the Actuarial Bureau of the National Board of Fire Underwriters—published elsewhere in this issue—reveal that but seven-tenths of one per cent of the fires in New York in 1915 were caused by gas—natural and artificial. Electricity, exclusive of lightning, was the cause of 4.7 per cent of this State's fires.

In Pennsyvania, where a large percentage of natural gas is used, 1.2 per cent of the fires were caused by gas and 6 per cent by electricity. In New Jersey the ratio is two-tenths of one per cent gas-caused fires to 3.9 per cent caused by electricity.

The bureau is authority for the statement that individual carelessness is the greatest fire hazard. This must be particularly true in the case of gas-caused fires, since all are classed as strictly preventable. But, judging from the classification of electrically-caused fires as only partly preventable, even eliminating individual carelessness, there is still a hazard.

A Change in Day of Publication

Effective with this week's issue the day of publication of the AMERICAN GAS ENGINEERING JOURNAL has been changed from Monday of each week to Saturday of each week. Several factors combined to make the latter seem the logical day of issue.

When the AMERICAN GAS LIGHT JOURNAL was first published the news element was not a very important feature of the Journal, and the necessity of having it up-to-the-minute not so keen. In these days of news by telegraph and quick mail service, the news sections of the technical and trade journals have become an exceedingly important part of the whole, and the gas man has, rightfully, insisted upon having his news supplied him in the quickest possible time.

This journal has consistently endeavored to render an efficient service in this respect, but its efforts were, to a large extent, nullified, despite the utmost exertions to get such news and to print it promptly, due to the fact that the issue had to be in the mails Saturday, and, as a consequence, a large percentage of the copies merely laid in the post offices ageing over Sunday.

Also, due to the prevalence of the Saturday half-holiday custom, it was recognized that a large number of subscribers would be sure of reading each issue thoroughly. The general plan seems to be for a subscriber to glance hurriedly over his journal to decide what subjects he cares to read? Then the issue is put aside pending the opportunity to do so. By getting the AMERICAN GAS ENGINEERING JOURNAL into the hands of a very large number of its subscribers Saturday we are assured that this opportunity will be found within twenty-four hours, thus insuring that the copy marked for reading will not fail to be read, due to the fact that a subsequent issue has arrived before such an opportunity presents itself.

The Principal Interest of the Gas Companies in Regard to Lighting Business

The principal interest of the gas companies in regard to lighting business is the selling of gas. For this reason they should leave no stone unturned that would tend to promote such an object.

One of the reasons—possibly a very important one—why gas lighting has not been generally accorded the consideration its merits entitle it to is cheap mantles.

By this we do not necessarily mean low-priced mantles. Such mantles, which at the same time combine durability and good service, might better be termed economical mantles. We all know that mantles for certain uses do not require the finish that mantles of no greater efficiency require, yet cost less to make, and practically—for the specific use for which they are intended—are just as good. Such a mantle is an economical mantle.

Cheap mantles are those made primarily for an easy sale and a large proportion of profit, with no consideration to their ultimate value in use.

To the inexpert eye it is quite conceivable that they could be made to look just as good outwardly as the most expensive and efficient mantle fabricated, yet cost practically nothing to make.

Such a mantle might well be a menace to the gas lighting business, even if the retailer had the interests of his customer at heart, were it not that the simple test of using will reveal in a very short time how utterly worthless it is.

But the greatest menace to our lighting business connected with such mantles lies not in the intrinsic worthlessness of the mantle itself, but in the attitude too often found in dealers—that attitude best expressed in the statements:

"Why should I handle your mantle, which I concede is a good one?" My experience has been that when I sell one of them to a customer he doesn't come back for another for several months.

"When I sell him one of these I am sure to see him again in three or four weeks."

Sounds unscrupulous doesn't it? Yet such state-

ments have been made on more than one occasion.

There are several reasons why certain people, even though contending with cheap mantles, continue to light by gas. Only one of them is a substantial one.

The cost of gas lighting is so far below that of electric lighting that even with the wastefulness represented in the use of a cheap mantle, it still represents an economy.

Another reason is that in this country, as in other countries, a good proportion of the population is inclined to follow a " penny wise and pound foolish " policy.

A certain layman equips his fixtures with burners which are relatively high in cost. Not being truly intelligent enough to junk this equipment, though thoroughly disgusted with the inconvenience and expense the behavior of his mantles are causing him, and being ignorant of the true economy represented in the more expensive mantles, he goes on paying a premium on his penuriousness.

It is quite true, in this case, that gas lighting has not lost a customer through cheap mantles, but it is equally certain it has sacrificed a number of prospects, for such a man can be relied upon to be anything but a booster of gas lighting.

So long as our lighting business is so menaced by such insidious dangers as are contained in cheap mantles and the moral attitude of dealers who handle them, it is, figuratively speaking, resting on a very unstable foundation.

What, then, is the remedy? As a first step we would suggest that our real mantle manufacturers confine their popular advertising to that which is educational in nature. The public should be made well acquainted with the fact that there are mantles *and mantles,* and the difference between real economy and apparent economy in regard to the mantle.

As a further step the dealer should be eliminated entirely. Every dealer is not unscrupulous, probably this time represents a very small minority. But the dealer type is selling mantles. The gas company is selling gas.

The permanence of the mantle-making industry is a vital enough matter to the gas lighting equipment and appurtenance manufacturer. To the gas company the incandescent mantle should represent merely the means to an end. It should therefore monopolize the mantle distributing business in its territory, and purchase only such mantles as expert decision reasonably guarantees will represent the greatest ultimate economy and efficiency to the consumer, and which will result in the popularizing of the gas lighting. The true results sought in such a course should be increased in thousands of cubic feet of gas sold; of course with the rigid requirement that each cubic foot shall provide the maximum possible candle power of light—and not in the number of mantles sold.

But how may this be effected? This journal considers that this should be left to the ingenuity of the rank and file of the gas industry. It is sure, however, that it can be effected.

If no better course is suggested, we might propose the scheme of including the cost of burners, mantles and maintenance in the lighting rate. The permanence of our National tariff system is ample demonstration of the fact that the people of this country prefer to pay for their essentials indirectly. The dealer may sell his mantles at one-fifth the price the gas company is in reality charging for those it sells, but small as it is the dealers' charge represents a lump sum that stares one directly in the face. Even though they charge more, the gas company will get the business, and the consumer the service. Gas lighting as a consequence will prosper and the real mantle manufacturers will do a greater business than they ever did before.

Short Articles

For many months past this journal has been endeavoring to impress on its readers—those men who are actually doing the work of the industry and are making possible its present era of rapid development—the necessity of informing others of the work they are doing, and of the methods used in doing it. These efforts have brought very gratifying results to the industry as a whole.

Men, who, perhaps, have never felt the impulse to write for the mere sake of writing, when brought to a realization of what value an account of their experiences may have to others, have sent us articles which we feel have carried many valuable suggestions to the gas industry, and which have given rise to much favorable comment.

But one thing has been lacking. Apparently, our contributors have considered that unless they had something big to write about there was no demand for their writings.

It must be remembered that the gas industry is made up of many units. There are companies of colossal size and others which beside them appear like pygmies. Both classes have their problems, and it is the duty of the gas journal to help them solve them.

There are many things connected with the industry, which would convey suggestions of great value, that can be described in a few hundred pages. There are others for which a hundred words and an illustration would suffice. The AMERICAN GAS ENGINEERING JOURNAL extends an especially warm welcome to such contributions.

The works of great magnitude are of direct interest to but few, these minor accomplishments interest all. This journal does not care how contributions are prepared. It is the facts that we want, and ideas that will be valuable to the industry.

Special English Correspondence

Monthly Letter from Norton H. Humphrys, Salisbury, England

Oxide Purification—For and Against the Calorific Standard—Oxide Experiences of Gas Managers—Size of Purifiers

At a meeting of the Midland Association of Gas Managers, held on the 26th ult., the subject of Oxide purification came in for active discussion, on the initiative of a paper read by W. C. Jones, of Brierley Hill. Starting with the assumption that the gas as delivered at the inlet of the dry purifiers was free from ammonia, and tar fog, the author claimed that the work remaining to be done comprised the complete removal of sulphuretted hydrogen, and other sulphur compounds, so far as was compatible with economy. Mr. Jones is a believer in ample purification area, and recommended as a practical rule, that the superficial area of each box (presumably referring to a set of four), should be equal to the maximum daily make of gas in 1000 cu. ft. He used a set of four, each 20 ft. square by 6 ft. deep, and had not yet attained a make of 400,000 cu. ft. of gas per 24 hours. The valves were arranged to work any number of boxes in any sequence. Each box was fitted with a separate pipe for the supply of air or steam, and with hurdle pattern grids.

Irish Bog Ore as Used for Purification

Speaking of Irish Bog Ore as largely used for the purification of gas, he submitted that the sample containing the largest proportion of iron was not necessarily the best. Out of two samples in equal physical condition, he preferred the one that contained the higher proportion of moisture. A fully hydrated material would carry more moisture than one containing anhydrous oxide and perhaps nodules of unoxidized iron, so he preferred the moisture test to actual chemical analysis. For oxide that required preparation, he preferred manure from stables where moss litter was used as a bedding material, to sawdust or coke breeze, as better assisting the mass to retain a granular, friable condition with a maximum content of moisture. And before damping down, the material should be tested by placing a handful in a large jar of water and stirring well. If after settlement the liquid was not decidedly blue to litmus paper, ammoniacal liquor might be used instead of water for mixing, or other alkali added. He worked with a downward flow of gas, on the backward rotation system, the last in the series becoming the first after each change, and used anything up to 5 per cent. of air, 2 to 3 per cent. being sufficient as a rule. The action of revivifying was quicker than that of sulphiding, and therefore the material in the second box would be restored before the first was fouled. It was seven years since he began to give special attention to the oxide purifiers, and since that date had gradually improved until he was able to run a charge for two to three years, starting with new material and going on until it was spent. The best result he had obtained was a new oxide, 60 per cent. moisture, when placed in the purifier, and removed when containing 61 per cent. sulphur and 6.8 per cent. moisture. As to removal of sulphur other than sulphuretted hydrogen, the best results were secured when an oxide rich in organic humus was used, as the humus exercised a powerful action in decomposing the organic sulphur compounds with liberation of sulphuretted hydrogen, and for that reason, new oxide should never be used last in the series in the absence of a catch box.

Discussion of Experiences

In the course of discussion, J. Ferguson Bell expressed belief in buying oxide according to analysis, as being a good indication of value received, though of course the physical condition must not be overlooked. He preferred old oxide as the best material for mixing with new, if admixture was necessary. Care was very advisable as to the percentage of air admitted, because an excess might send up the sulphur compounds to an objectionable extent. He had known them to go up to 120 grains per 100 cu. ft. of gas in the course of a few hours. And it must be remembered that a certain quantity of air found its way into the gas, in addition to any that might be designedly admitted. He was strongly in favor of keeping down the sulphur compounds to the lowest practical limit, and they could be considerably reduced before the gas reached the dry purifiers, by washing with strong ammoniacal liquor. B. W. Smith approved the last remark. He used a mixture of 75 per cent. artificial oxide and 25 per cent. of a natural clay iron ore. G. Stevenson also advocated a pure gas, and keeping down the sulphur. H. E. Copp agreed with a previous washing with strong ammoniacal liquor, and with the use of a separate pipe to each box, by which air or steam could be admitted, without having to run the gauntlet of the whole series. S. T. Smith favored large purifiers, careful attention to the proportion of moisture in the oxide, according to the amount of iron present in it, and careful adjustment of the air supply. He changed the rotation every three days, and if the oxide appeared sluggish, he by-passed the scrubber for a few hours, and let a little ammonia forward. It was observed that he did not alter the rotation at fixed times, but when the second box showed a foul test. Mr. Canning said that the excess of air, apart from its effect on the gas, might cause serious trouble by corrosive action on the purifier plates and covers. W. S. Cranmer preferred mixing old oxide with the new, rather than the useless foreign diluent. He obtained the best results when the oxide was as dry as possible, but his boxes were exposed in the open, and perhaps this would be different if they were kept dry, and under cover.

The rule for fixing the size of purifiers may apply, up to a make of one million cu. ft. per day, but at about that limit the largest size convenient in practice would be reached. The author of the paper comes to the very reasonable conclusion that an oxide that will absorb

water freely will be in the finely divided condition that is conducive to the most efficient action in the purifiers. In my experience, a copious washing with somewhat weak ammoniacal liquor is preferable to strong liquor, for the removal of sulphur other than sulphuretted hydrogen. The strong liquor may exert the well known carbonating action, if much carbonic acid is present, and drive sulphur forward instead of removing it. In fact, strong liquor has been recommended as a means of removing carbonic acid.

An inquiry held at the board of trade offices in reference to an application by the Sheffield United Gas Company for a provisional order, under the Calorific Power Standard Act, furnishes an excellent example of the evidence for and against the substitution of the calorimeter for the photometer, as the standard testing instrument. On behalf of the applicants, it was mentioned that previous to the war they had maintained a quality of 15 candles, but that since the abstraction of benzol from the gas, for the use of the Government, had been adopted, they were unable to adhere strictly to that standard. Two railway companies supplied by the applicants took the opportunity to ask for an increase of pressure obligations, and the company was willing to meet their views to the extent of accepting a minimum of 15 tenths. In the principal parts of their district, the company had maintained a higher figure, and there was no intention of reducing the established custom as to supply. The Sheffield Corporation agreed with the principle involved, but urged that in order to maintain the present status in regard to the quality of the gas supplied, the minimum should be fixed at 550 B.t.u. and that the adoption of a 500 B.t.u. standard would practically admit an important reduction in quality and value, as compared with the present supply. This meant that they did not object to the calorimeter so long as the existing composition and quality of the gas supply were continued unaltered. There was no exact ratio between candle power and calorific value, and the effect of the order, if made, might be a trifling reduction on the direct photometrical value of the gas, perhaps to the extent of one candle. Such a reduction would still leave Sheffield above the average quality prescribed throughout the country.

Growth of Demand for Calorific Standard

In 1910, the photometrical value of the Sheffield supply was reduced from 16½ to 15 candles, and this step did not result in any special complaint from the consumers, probably because while the quality was sufficient, the selling price was lower. The company claimed that the present proposal was advantageous in the interest of the consumers, that the opposition did not represent any feeling on their part, and was in fact a theoretical rather than a tangible objection. There was the usual claim on behalf of the rapidly diminishing class who preferred to use flat flame burners. In 1910, the same company accepted a provision that they should supply suitable flat flame burners, free of charge to all those who required them, but out of nearly 100,000 consumers, only 386 availed themselves of that arrangement.

Although the minimum asked for was 500, the company would actually supply a 530 to 540 B.t.u. quality gas. In 1911 they laid themselves out to encourage the use of gas for industrial purposes, and since that date had supplied 657 furnaces, representing a consumption of about 40 millions cu. ft. of gas per hour; and during the same period they had connected up gas engines, to the extent of 15,166 horse power in the aggregate, which would consume when in full operation, over 20 millions cu. ft. per hour. Photometrical value was of no importance to this class of business, but a cheap gas was the first consideration.

Harry E. Jones gave evidence as to his experiences with the Calorific Standard, in connection with three London gas undertakings. The minimum was 500, but the actual supply averaged 525 B.t.u., the 14 candle power was fully maintained, and there was no complaint, not even from the users of flat flame burners. Prof. W. A. Bone said that for furnace purposes, it made little difference whether the minimum under the regulations governing the gas supply was 450 or 550 B.t.u. provided that the consumer received the largest possible number of heat units in the form of gas at the lowest cost.

Counsel for the corporation submitted that the effect of the proposal, in practice, would be that the company might save, say $48,000 but that, irrespective of the use to which the gas was applied, the consumer would have to buy more gas to the extent of $72,000, so that if the gas company gave the consumers the whole benefit of their savings, the consumers would still be substantially out of pocket. Therefore they asked that the quality should not be reduced, on the present standard, and this would not be secured unless the minimum was 550 B.t.u. Witnesses stated that the proposed new value would in effect represent about 12 candle gas, and that there was no foundation for the suggestion that the consumer be willing to use a larger quantity of inferior gas, in order to obtain the same results. The saving to the company would be more than offset by extra cost to the consumer, and the proposition was not a sane one, from the consumer's point of view. Calorific and photometric value rose or fell on a definite ratio, which was about 3 or 4 per cent., for gases of 12 to 16 candle quality. The economy to the gas company was put at $144,000, and the extra cost to the consumer at $312,000 on the assumption that one-fourth of the gas was used in flat flame burners. (The proportion for flat flame burners would in practice be nearer one-fortieth, which knocks the bottom out of this estimate.)

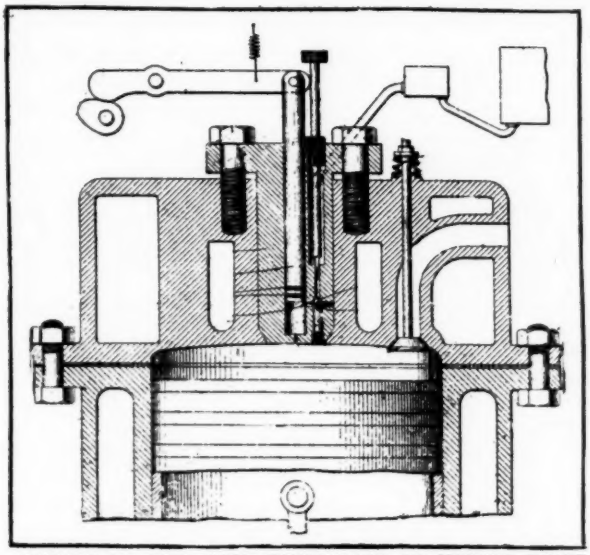
The decision of the Board of Trade has not yet been made public.

Advantages for Use in Suburban Residential Sections

From the standpoint of personal cleanliness, the gas-fired heating systems make an inviting show-place for one's friends. Coal dust and ashes from the basement are not found distributed throughout the house, either through hot-air ducts or through casually opened doors. Room furnishings are not grimy, the air is not contaminated with sharp dust particles which lacerate the lungs, and even bring disease.

The use of gas for heating in the suburban residential sections means the abandonment of carting coal across well-kept paths and lawns. It means whiter paint, because of the freedom from the dust of both coal and ashes. In other words, when we substitute gas heating for coal heating we get in return ease of mind, personal comfort, health and cleanliness at a minimum cost. And it is encouraging to note how many are gaining these advantages by the substitution.

Patents Pertinent to Gas Industry



AMOUNT OF FUEL USED CONTROLLED BY NEEDLE VALVE

Piston Forces Fuel Into Cylinder of Internal Combustion Engine

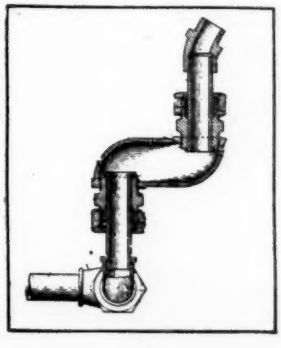
Patent No. 1,208,012; described in Patent Office *Gazette*, 12-12-16, page 467. Eugene A. Riotte, Douglaston, N. Y., assignor to Standard Motor Construction Company, Jersey City, N. J. Filed July 7, 1916. Serial No. 107,897. (Cl. 123-32.)

The fuel-feeding piston is driven by the engine, and operates backwards and forwards in a long cylindrical channel, extending almost through the cylinder head. In the bottom of this channel and leading into the cylinder itself is a small passage, through which the charge is forced into the cylinder by the action of the piston. Connected laterally with this channel is another small passage which leads from the fuel supply line, the amount of fuel being controlled by a needle valve. The piston alternately draws in a charge of fuel, then closes the fuel supply passage and forces the charge into the cylinder.

Swing-Joint Connection Allows Pipes to Lie in Any Plane

Patent No. 1,208,002; described in Patent Office *Gazette*, 12-12-16, page 464. William Queenan and John F. Hansen, Aurora, Ill. Filed Dec. 16, 1913. Serial No. 806,981. (Cl. 137-34.)

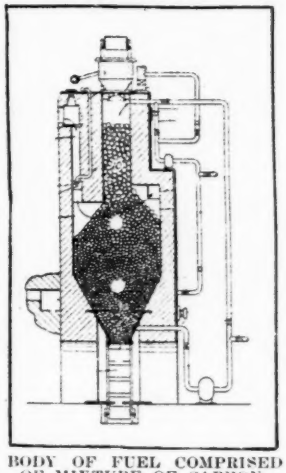
Two of the three essential parts of the joint are provided with packing boxes, which allow the connecting member to be swung into any position without leakage.



Method of Making Combustible Gas Uses Intermediate Carbonizing Section

Patent No. 1,207,724; described in Patent Office *Gazette*, 12-12-16, page 368. Henry L. Doherty, New York, N. Y. Original application filed November 15, 1911. Serial No. 660,449. Divided and this application filed Jan. 29, 1915. Serial No. 5,111. (Cl. 48-206.)

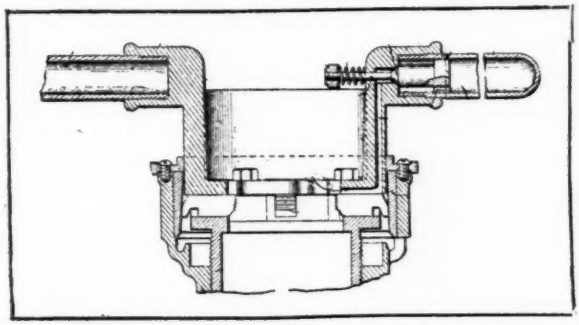
In this process the body of fuel comprises a mixture of carbonized and bituminous fuel, in such proportions that the latter fuel will not cake. When the fuel body passes into an intermediate region, combustion is brought about by passing a balanced draft current comprised of a mixture of water vapor and air through the fuel. A small portion of the gas which is produced is withdrawn in order to cool the combustible gas produced and to preheat the fuel supply which is advancing towards the carbonizing section.



BODY OF FUEL COMPRISED OF MIXTURE OF CARBONIZED AND BITUMINOUS FUEL

New Oiling Device for Pipe Threading Machine Does Away with Oil Can

Patent No. 1,207,887; described in Patent Office *Gazette*, 12-12-16, page 425. Hiland R. Farnsworth, Sandusky, Ohio,



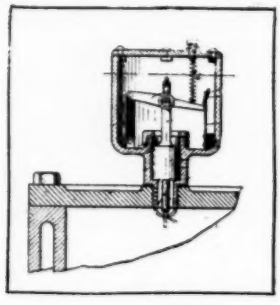
GUIDE HEAD PROVIDED WITH SOCKET AND DUCT LEADING TO CUTTING DIES

assignor, by mesne assignments, to The Threading Machine Company, Sandusky, Ohio. Filed Jan. 3, 1916. Serial No. 69,858. (Cl. 10-126.)

In this device the guide head is provided with a socket and a duct leading to the cutting dies. A tubular handle is detachably secured to the socket, and serves as the lubricating oil container. The end of the handle nearest the dies is equipped with a valve which is opened and which allows oil to be conveyed to the dies.

Gas Engine Igniter Is New Type of Spark Plug

Patent No. 1,207,753; described in Patent Office *Gazette*, 12-12-16, page 379. Albert B. Herrick, New York, N. Y., assignor to Matie C. Messler, Providence, R. I. Filed Feb. 4, 1915. Serial No. 6,049. (Cl. 123-166.)

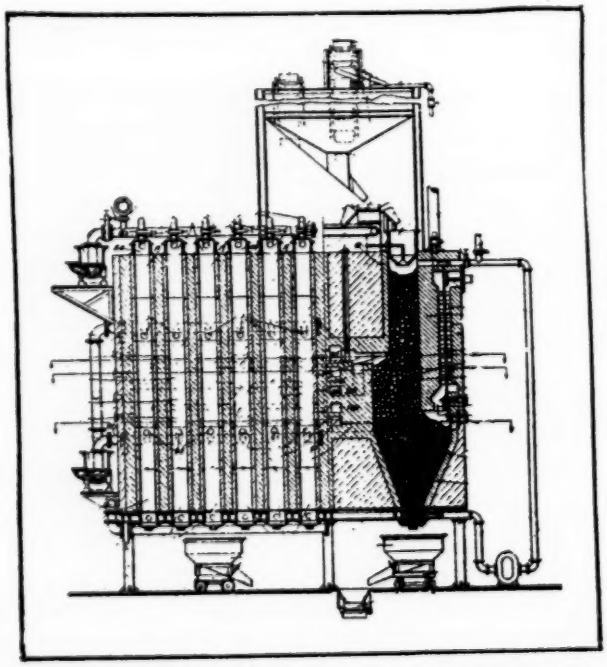


The spark plug is provided with fixed spaced electrodes and an aperture. Mounted in this aperture is a movable member which is actuated by the compression in the engine cylinder, breaking an electric circuit, and thereby causing a spark across the electrodes of the spark plug.

Intermediate Carbonizing Section Used for Carbonizing Fuel

Patent No. 1,207,723; described in Patent Office *Gazette*, 12-12-16, page 368. Henry L. Doherty, New York, N. Y. Original application filed November 15, 1911, Serial No. 660,450. Divided and this application filed Jan. 29, 1915. Serial No. 5,110. (Cl. 48-210.)

In this method of fuel carbonization, the retort has comparatively long end extensions and an intermediate localized carbonizing section. The raw fuel is charged into the top end, and the coke withdrawn from the bottom end, the raw fuel being heated and the volatile matter distilled in the carbonizing section. The by-products from this distillation are passed upward into contact with the entering fuel in order to condense the tar-forming products of the distillation on the raw fuel.



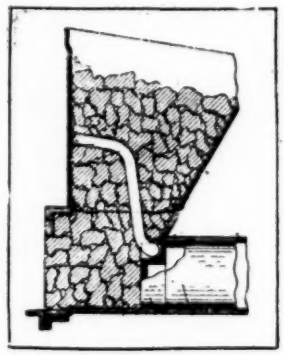
RAW FUEL CHARGED INTO TOP END AND COKE WITHDRAWN FROM BOTTOM

The process is reversed by reversing the travel of the gas when the viscous material becomes too thick at the top of the retort, and the tar is again forced into the carbonizing section in contact with the hot fuel in order to revaporize it. The gases are taken off of the retort from both ends.

Coal Agitator for Mechanical Stokers Is Operated by Reciprocating Plunger

Patent No. 1,208,011; described in Patent Office *Gazette*, 12-12-16, page 467. Robert Sanford Riley, Worcester, Mass., assignor to Sanford Riley Stoker Company, Limited, Worcester, Mass. Filed March 4, 1916. Serial No. 82,239. (Cl. 193-1.)

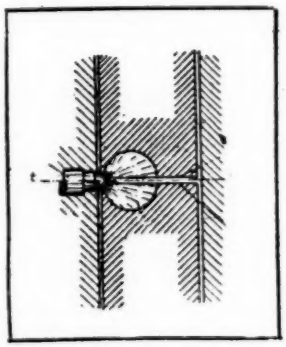
In connection with a coal feeding mechanism, the end of a coal agitator is pivotally connected with a reciprocating plunger. The agitator is so arranged that the upper end is free to move in the hopper, while the form of construction allows for a space underneath which is sufficient to hold a complete charge of fuel when the plunger is retracted.



Combustion Chamber Formed by Recesses in Piston Heads

Patent No. 1,207,799; described in Patent Office *Gazette*, 12-12-16, page 395. Wilhelm Scheller, Aachen, Germany, Assignor to Hugo Junkers, Aachen, Prussia, Germany. Filed Nov. 18, 1915. Serial No. 62,228. (Cl. 123-51.)

In this internal combustion engine two pistons reciprocate in opposite directions simultaneously, and are so arranged that at the inner end of their stroke they come almost into contact. In each piston head a recess is provided, so that when the pistons are close together at the inner end of the stroke, the recesses act as the combustion chamber.

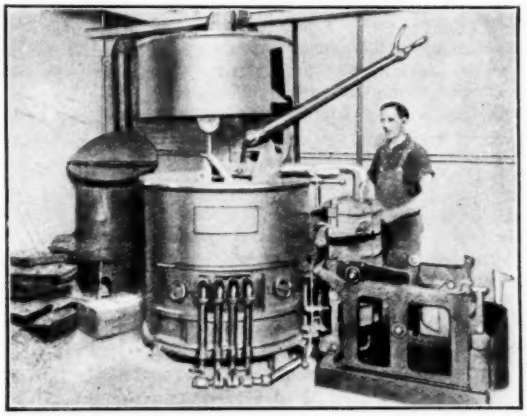


Process for Absorbing Carbon Monoxid Uses Cuprous Compounds

Patent No. 1,207,968; described in Patent Office *Gazette*, 12-12-16, page 453. Wilhelm Meiser and Carl Krauch, Ludwigshafen-on-the-Rhine, Germany, assignors to Badische Anilin and Soda Fabrik, Ludwigshafen-on-the-Rhine, Germany, a Corporation. Filed Feb. 25, 1915. Serial No. 10,565. (Cl. 48-220.)

In order to absorb carbon monoxid from gases containing it, the gases are treated in an iron apparatus with an ammoniacal solution of cuprous compounds substantially free of halogen. The compound may contain a weak acid.

News of the Gas Industry



GAS FIRED STEREOTYPE MELTING FURNACE

One of Toronto's Printing Establishments Uses This Gas Furnace

"Metal Melting With Gas" is the caption of an attractive advertisement gotten up by the Consumers' Gas Company of Toronto, Can., and appearing in the "Board of Trade News." This only shows one of the many similar gas installations which are being used in practically all of the large stereotyping rooms all over the country. The advertisement goes on to say in an interesting manner:

"The accompanying view is one taken in a Toronto printing establishment and shows a 7,500 lb. stereotype melting furnace equipped with gas burners, which was designed and installed by the Consumers' Gas Company, and also a gas fired furnace for the remelting of linotype slugs.

Men of considerable experience say that gas is the fuel to use in doing this work, and that its greatest advantage is the ease with which the operator can control the temperature and hold it, thereby preventing deterioration of the metal. It is generally admitted that this cannot be done as well with any other form of fuel. The advantages of gas for melting linotype metal are so obvious that practically every printer in Toronto uses it for this purpose."

New Gas Legislation Proposed by Massachusetts Commission

In connection with the opening of the 1917 session of the Massachusetts Legislature, the Board of Gas & Electric Light Commissioners proposed three new enactments and an amendment, which have to do with laws relating to gas and electric utilities in the state.

It is proposed to put the managers of all the municipal plants in the state under the civil service. The board says that under present conditions "the insecure tenure of the managers' offices and the pressure brought to bear on them to permit harmful practices regarding the plant is a great weakness." The manager of the largest and most successful municipal plant in the state (Holyoke), was recently put under civil service laws, "greatly to the plant's advantage."

Another change in the law relates to the disposal of municipal plants. It requires a two-thirds vote on two separate referendums to enable a community to acquire a gas or electric plant, but the laws are silent on the matter of disposing of a plant once acquired, and the process is much easier. The board would make it equally difficult to sell as to buy or start a municipal plant, and has drafted a bill to that end.

The municipal plants of Massachusetts do not now pay any part of the commission's running expenses, the companies being assessed in proportion to their size for this expense. The commission thinks it only fair, in view of the increasing service rendered community plants, that they should help pay for the supervision.

Other measures proposed have to do with electric plants' supply of current to street railways and the commission's supervision of transmission lines.

Cost Per Lamp for Omaha, Neb., Lights

The annual cost per lamp for gas street lights in Omaha, Neb., during 1916 was $24.05, according to the annual report of City Gas Commissioner Butler and A. C. Taylor, superintendent of gas lighting.

The payroll of the department totaled slightly more than $9,000, and the gas cost $16,000. Mantles cost $1,200, and globes slightly more than $1,000. Sixteen lamps were installed, nineteen removed and 1,265 were in service at the end of the present year, according to the report. The quality of gas was tested 549 times during the year.

Barre, Vt., Receives Gas Revenue

The earnings of the People's Lighting, Heating & Power Company, Barre, Vt., for the year ended June 30, 1916, were $30,542. By the terms of the franchise, the city receives 2 per cent. of the amount, or about $611 this year.

Illinois Gas Association President Undergoes Serious Operation

Charles W. Bradley, of Chicago, gas engineer of the Public Service Corporation of Northern Illinois, and president of the Illinois Gas Association, was brought down last week with a serious attack of appendicitis. He was removed to the Henrotin Memorial Hospital, where an operation was performed immediately. For some time grave doubts existed as to his recovery, but this journal has been informed that he is now progressing favorably.

Mr. Bradley was educated at Cornell University, being graduated as a mechanical engineer and first engaged in the gas business about sixteen years ago, in the employ of the Peoples Gas Light & Coke Company, of Chicago, in which connection he remained until a couple of years ago, when he took up his present connection. He is the son of W. H. Bradley, chief engineer of the Consolidated Gas Company, of New York City, who visited him in Chicago, while in the hospital.

Profit-Sharing Plan at Troy, N. Y.

In line with the policy recently adopted by the board of directors, the Troy Gas Company announced recently that owing to the increased cost of living, and for faithful service, employees whose pay is less than $2,200 per annum, will receive each three months the same rate of dividend on their salaries as the stockholders of the company receive on their stock. This will mean an increase in wages of approximately $10,000 per year, and will go into effect at once.

In commenting on the action of the company, Henry C. Shields, vice-president and general manager said: "The company, like most other lighting companies has benefited to some extent by the increased sales of gas and electricity, due to the prosperity of its consumers, but on account of the large increase in the cost of all materials and supplies used by the company, ranging from 30 to 125 per cent., the net results have not shown as well as those of most other corporations. This is due to the fact that the lighting companies are confined to fixed prices for the sale of their product."

Notwithstanding these conditions the trustees of the company considered several plans of benefiting their employees and finally adopted the profit-sharing one as outlined in the resolutions passed at its meeting, as the best one to promote the hearty co-operation of all classes of its employees, without which it is impossible for public service corporations to furnish first class service to its customers.

Novel Gas Floats Attract Much Interest in Waycross Parade

One of the high spots of interest during Electrical Prosperity week at Waycross, Ga., was a parade held on the Organized Labor night, and all of the principal business concerns of the city had floats of some kind. The Consumers' Gas & Coke Company arranged their float by using a gas tank that is ordinarily used on passenger coaches, filled with gas to the pressure of 125 pounds and carried on a truck. To this a pipe was connected and extending out about 120 feet with hose connections all along about four feet apart. To these were attached C. E. Z. burners with a hose about two feet long, and in the parade the men walked on each side carrying these burners in their hands. The effect was very attractive.

The gas company also had another float on a large wagon with a partition in the middle. In the front was displayed "The Old Way," the old wood stove with its accompanying dirt and smoke, and an old negro cook. On the back was shown "The Modern Way" with the gas range, the pretty maid with white cap and apron.

New Jersey Public Service Gas Company Shows Big Gain in All Branches

Use of gas as an illuminant and for fuel purposes in the districts controlled by the Public Service Gas Company of New Jersey has shown an increase of 10 per cent. during 1916 over the preceding year, according to the company's sales records. The growth in total consumption of gas is readily credited to the steady advances in the designing and manufacturing of fixtures and the further development of the incandescent mantle.

While there has been gratifying growth in the lighting end of the business, the use of gas as a domestic fuel has shown even a greater proportion of increase, while the sales of gas for industrial fuel purposes have outstripped both of the other features of the business, giving what the Public Service officials regard as evidence that manufacturers are beginning to recognize the advantages of the even, controlled heat produced by gas and making possible their use of gas in a wide variety of processes in which heat of that character is a prime essential. The total consumption of gas for all purposes in the territory served by the Public Service Company, which embraces 159 municipalities in twelve counties, was approximately 1,250,000,000 cu. ft. more in 1916 than in 1915. It is possible to gather an idea of the magnitude of the increase in business done when consideration is given to the fact that the sales gain represented is one of about 3,420,000 cu. ft. a day average.

The ratio of increase, on a percentage basis, was greatest in the case of gas for industrial purposes, a gain of more than 30 per cent. in this branch of the business being accounted for by the making of a number of large installations of gas-using facilities. Additional customers also help to explain the increased use of gas, the number of meters in service on Dec. 1 last having been 495,045, as against 472,276 on the corresponding date of the year before.

What the officials take as evidence of the ever increasing popularity of gas is the fact that during eleven months of the year just ended the company sold 151,928 gas-burning appliances of various kinds. This figure, made at the close of business on Dec. 1, takes no account of the many appliances, fixtures and lamps sold by supply houses and department and other stores throughout the territory in which the Public Service operates. The total value of the appliances sold during the eleven months to Dec. 1 was nearly $1,400,000 and the sales covered a great variety of articles. For household, hotel and restaurant uses there were 26,261 ranges installed, which is about three thousand more than were installed during the previous year. Of gas water heaters there were sold during the eleven months of the last year 11,316, as against 9,963 for the whole of the preceding year. Other items of the sales of 1916 included 7,954 heating stoves, 2,008 hot plates, 4,720 gas arcs, 51,921 Welsbach lamps, 13,948 gas fixtures, 1,657 manufacturing appliances, 32,100 domestic gas appliances of miscellaneous character and 43 gas engines.

Increase in Coal Tariff Suspended

Tariffs of the Pittsburg, Cincinnati, Chicago and St. Louis and other railroads proposing increases of from 15 to 30 cents a ton in the freight rates on bituminous coal from Pennnsylvania and West Virginia points to destinations on the Erie, Lehigh Valley, Lackawanna, New York Central and other Eastern roads were recently suspended by the Interstate Commerce Commission until April 14 pending investigation.

Proposed increases of from 1 to 30 cents a ton on coal over Southwestern carriers from Dawson, N. M., to Texas points were suspended until the same date.

Pittsfield Company Thaws Ground with Steam Pipes

The Pittsfield (Mass.) Coal Gas Company, which is laying about a mile of 3-in. high pressure main to furnish service to the General Electric Company, which recently bought the plant of the Triumph Voting Machine Company, is utilizing live steam to thaw the frozen ground preliminary to excavating the trench. There is now about 25 inches of frost below the snow and ice on the ground surface.

A boiler is rigged up so as to be portable, and to it is connected a metal pipe several hundred feet long. The practice is to advance the boiler and to relay the steam pipe about 4 o'clock each afternoon, and firemen are kept on duty to keep up steam all night. At 8 o'clock the next morning the ground is suitable for digging, the gas main being laid at a depth of 3 to 4 ft. With about 25 men employed, it is possible to excavate 400 ft. of trench a day. The work in the field is directed by George R. Nixon, district superintendent.

While the cost of main-laying under present conditions is greater than it is normally, the officials feel that the company's policy should be to serve its customers, even if it involves some hardship and extraordinary difficulty.

The steam apparatus is ready for use another winter, should occasion demand.

Earnings from Cyanogen Plant Have Already Repaid to Indianapolis Company Good Part of Its Construction Cost

First Plant in Country to Carry Process from Recovery of Gas to Finished Product which Can Be Sold Directly to Users

The establishment of a new industry by the Citizens Gas Company of Indianapolis, has been one of the big industrial developments in that city within the past few months, and the local newspapers devoted a great deal of attention to it at the New Year, when special editions were carried.

About the middle of 1915 the Citizens Gas Company began the operation of its benzol plants, which have continued to be a source of profit outside the regular operations of the company, and promise to yield substantial additions to the company's earnings even after prices become more nearly normal than they are at present. The company now has taken a further step in the construction of a plant for the recovery of cyanogen and the manufacture of this product into a commercial product. This plant began full operation only recently and has shown results, which have proved the wisdom of the company in its undertaking. J. D. Forrest, general manager of the company, gives the following account of this new byproduct industry.

Explains Gas-Making Details to Public

"Cyanogen is produced in the generation of coal gas and is a very deadly poison which would be a menace to gas consumers if it existed in larger quantities in the gas. Fortunately, it exists in such minute quantities that it has not prevented the use of gas in the ordinary appliances which are familiar to everybody. Sulphur and ammonia, because they usually exist in large quantities in the gas, must be removed in order to make it safe to burn gas in our homes, and from the beginning of the industry there has been more or less public regu-

lation requiring the removal of these impurities."

This type of interview from Mr. Forrest was printed very generally in the districts supplied by the Citizens Gas Company and the effect of such educational work among gas consumers has been felt already in a closer interest by the general run of consumers in the business of the local gas company. Mr. Forrest continued:

"The ammonia has a high value and is a source of income to coal gas manufacturers, but the sulphur which is removed represents a waste and expense, because its reclamation in commercial form would not be profitable. The cyanogen in the gas has not been recovered by gas companies generally because it exists in too small a quantity to be injurious to the public, and the cost of reclaiming it has usually been too high to justify the undertaking. Recently, however, the New York and Philadelphia gas companies, and one or two others have undertaken to reclaim cyanogen in a crude form and to sell it to the chemical companies which are engaged in manufacturing various cyanide compounds.

First Concern in Country to Carry through Complete Process

"The Citizens Gas Company of Indianapolis, is the first concern in the United States which has undertaken to recover the cyanogen from the gas and carry it on to a finished product which can be sold directly to consumers. On account of the increased cost of various cyanide compounds, due to the war, the Citizens Gas Company found it possible to make a contract running to the end of 1917 for the sale of all of the sodium ferro cyanide which it could produce, and this contract justified the construction of a plant and the beginning of the industry in this city.

"While the normal price of this product is only one-third of the price at which the gas company is now selling it, the costs of manufacture will also be very much lower under normal conditions. The consumption of the product is also increasing in this country, so that the gas company expects to realize permanent benefits from this new industry although the returns are not likely to remain at the high level of the present time.

Use in Dyestuffs Production

"Sodium cyanide and potassium cyanide are used in the recovery of gold. The gas company does not undertake to make these products, though its plant carries the process up to a point from which its present products could easily be carried further if it should seem advisable to make an additional plant investment. For its present customers the product turned out by the gas company is more satisfactory than that which is used in the separation of gold from its ores, and if the latter material were used by these customers, it would be necessary for them to put in the iron content which must be removed when cyanogen is used in recovering gold, but which is at present in the product of the Indianapolis plant. The product of the gas company's plant is used in the manufacture of colors and it is an interesting commentary on American ingenuity and skill that the color manufacturers have developed a process by which this material can be used as successfully as potassium ferro cyanide was formerly used.

"The potash element was always supposed to be essential to the production of satisfactory blue colors when these were being supplied by the German dye industries. When the war cut off the importation of German dyes and also caused a very great increase in the price of potash, certain manufacturers began to experiment with cyanide in the soda compound, and succeeded in obtaining results as satisfactory as those which had previously been obtained from the use of cyanide in the potash compound. The result has been the establishment of a new color industry in the United States, and the Citizens Gas Company is supplying it with its principal raw material. It will be equally possible to produce the potash compound at the gas company's plant, but since soda is always cheaper than potash it will probably not be found desirable to do this, even after the close of the war.

Situation Required Considerable Experimenting

"The Citizens Gas Company is not the only producer of sodium ferro cyanide in the country, for there are two large chemical companies which buy the crude cyanogen from the two or three gas companies which are now recovering it, and they also obtain their raw material from other sources. However, the Citizens Gas Company is the only concern in the country which carries on the complete process from the recovery of the cyanogen from the gas to the manufacture of the finished product. In order to do this it was necessary for the gas company to design its own plant, and this was done after a long series of tests of the gas at different points through the byproduct system and a careful chemical study of the reactions which would be set up by various processes at various stages in the movement of the gas through the byproduct house.

"Naturally this situation required some experiment, thus making necessary a considerable delay between the decision to go into the business and the turning out of the commercial product. The difficulty in getting certain kinds of equipment caused still further delays. Thus it happened that the full operation of the plant was not reached until October, and it is believed that some improvement in the results still will be possible. However, the net earnings from the plant have already repaid the company for fully half of the cost of the construction, and a handsome margin of profit is assured before the expiration of the present contract for the sale of the output."

Boston Street Explosion Results in Death of Newsboy

Gas, which had seeped from a break in an underground pipe into a conduit of the Edison Electric Illuminating Company in the vicinity of Broadway, K and L streets, South Boston, exploded 5:30 o'clock Jan. 1, instantly killing Thomas Nugent, a 14-year-old newsboy, severely injuring several persons, hurling a dozen manhole covers high into the air and causing damage to property estimated at several thousand dollars.

The district, more or less congested during the rush hour, was at once thrown into a panic. The twelve covers, ripped from the manholes, went hurtling through the air like high-power shells, bursting into many pieces and showering the vicinity with an iron hail. The concussion itself shook South Boston to its foundations, and windows on Broadway and neighboring streets were broken as far as a quarter of a mile away.

Thomas Nugent was standing almost at the edge of a manhole at Broadway and L Streets when the explosion came, busily selling papers.

He was picked up bodily by the force of the expanding gases and thrown to the ground some distance away, his papers flying about the street. A piece of the flying manhole cover had struck his head, crushing the skull and killing him instantly.

Scores of persons in their homes or stores within this radius were thrown to the ground and momentarily stunned by the violence of the explosion, and a moment later the streets were filled with excited citizens, fearful that an earthquake had occurred.

As yet the exact cause of the explosion has not been discovered. The police theory is that it was caused by escaping gas, which had no outlet because of the frozen dirt and ice on the covers.

Large Gain for Old Colony Gas

The Old Colony Gas Co. reports output for December, 1916, 7,720,000 cubic feet as compared with 6,272,000 cubic feet for December, 1915, an increase of over 21 per cent.

The company also reports output for the six months ended December, 1916, 49,640,000 cubic feet as compared with 41,188,000 cubic feet for the same period of the previous year, an increase of over 20 per cent.

F. R. Hutchinson to Talk on Gas House Heating

At the next meeting of the Dayton, Ohio, Section of Gas Meeters, Monday, Jan. 29, F. R. Hutchinson, sales manager, of the Gas Appliance Company, of Cleveland, O., will address members and employees of the Dayton Gas Company on the subject of "Gas House Heating, its cost and application."

Industrial Rate Increase for Large Users at Portsmouth, Ohio

An increase in the gas rates of industrial consumers, at Portsmouth, O., effective Feb. 1, has been announced by the Portsmouth Gas Company.

Beginning with this date industrial firms using 150,000 cu. ft. of gas will pay 26 cents per 1,000 cu. ft. and 21 cents for the next 150,000 cu. ft. Firms using gas in excess of 300,000 cu. ft. will pay 16 cents up to 150,000,000 cu. ft. These prices are subject to a discount of one cent per 1,000 for prompt payment.

The industrial rate now effective in the city and county is 26 cents for first 150,000 cu. ft. and 19 cents for next 150,000 cu. ft. and 13 cents for gas in excess of 300,000 cu. ft. and up to 150,000,000 cu. ft.

According to a statement made by Superintendent John McMillan of the Portsmouth Gas Company not over ten industrial firms of this city will be affected by the new gas rate.

Fire Commissioner for Metropolitan Boston Discusses Outside Shutoffs

That outside shutoffs for gas services should be generally installed, at least in connection with premises that constitute an especially dangerous fire hazard, is the belief of John A. O'Keefe, fire prevention commissioner, for the Metropolitan District of Boston. This idea and aim was expressed before a meeting of Massachusetts fire chiefs held in Boston, Dec. 20.

As the matter now stands, each city and town has the legal authority to pass an ordinance which shall require such safety appliances. There are few municipalities in Massachusetts which require them, this being true of Boston and Cambridge, as well as most of the suburban places. Six towns served by the Old Colony Gas Company, viz.: Braintree, Abington, Rockland, Whitman, Weymouth and Hingham, now have outdoor shutoffs in connection with every building or house served, whether it be a business block or a seaside cottage. The gas company took up the policy of installing them, on its own initiative. Keys to the shutoffs are provided for each piece of fire apparatus, in every one of the towns mentioned. It is found somewhat difficult to impress the firemen with the idea that it is very desirable to keep these keys where they are immediately available in case of fire.

In Lynn, the Lynn Gas & Electric Company is installing outside shutoffs wherever the chief calls for them; the understanding being that the requirement shall pertain only to cases where the danger is obvious. Commissioner O'Keefe is not prepared to order the general adoption of this safety precaution throughout his district, which includes Greater Boston and the municipalities within about 10 miles of the city, but is trying to induce the gas companies to meet the situation so far as immediate needs appear.

In an interview with the representative of the AMERICAN GAS ENGINEERING JOURNAL, Commissioner O'Keefe pointed out that the usual sheet metal gas meter with soldered corners, and the lead connection with the service pipe are liable to be seriously affected by the heat of a fire nearby. When the lead or solder melts, gas pours out of the breach, causing explosions or else adding to the strength of the fire.

In Boston and in Lynn the gas departments have had some trying experiences from this cause. Fires in basements, where meters are likely to be located, are especially difficult to deal with.

The most effective remedy, in the commissioner's view, is the sidewalk shutoff, operated by a key which is kept in the fire department's custody. Often such a provision is an effective means of checking the spread of fire through escaping gas, especially in basement fires.

At the office of the commissioner is exhibited a cast iron meter, with bolted sections, manufactured by the Sprague Meter Company, Bridgeport, Conn. This is a type of meter which seems to possess advantages from the fire-resisting standpoint. With respect to service connections, the practice of using iron pipe rather than lead joints is strongly commended by the commissioner.

Mr. O'Keefe believes that where meters are in groups, as in apartment houses, they should be installed in a fireproof room set apart for them. He cited one instance of a tenement house where 54 meters are bunched together, with no such precaution. Such practice is fraught with danger, is the commissioner's belief.

Springfield Company Proposes Extension

The board of selectmen of Springfield, Mass., learned at the hearing of the Rivers and Harbors Commission in Boston which they recently attended that the Springfield Gas Light Company intends to build out from the enforcement already constructed further into the Connecticut river. The plans for the gas light company call for an added extension of 60 ft. on the north end of the present "riprapping" and 75 ft. on the southern end. The present enforcement is on land of the company about 60 ft. below the toll bridge and the new work is liable to affect the placement of the town sewer, which may have to be lengthened. It was this fact and also possible complications in the event of a new river bridge being constructed that decided the board to investigate the situation.

New Properties Acquired

Within the past month, W. S. Barstow & Company, Inc. have acquired leases on valuable coal mining concessions at Hartland, W. Va., and will erect a 1,000 kw. electric plant on one of them to supply power for neighboring mines. The plant will be operated by the Hartland Power Company, recently incorporated with an authorized capital of $2,000,000, 7 per cent. preferred stock, $500,000 common stock and $1,000,000 first mortgage bonds.

In the same district the General Gas & Electric Company, has leased a large acreage of coal land from which its subsidiaries will be assured an ample supply of fuel.

The subsidiary companies of the General Gas & Electric Company served 13,131 artificial gas consumers on Nov. 30, a gain of 7 per cent. over the previous year. Natural gas was supplied to 5,605 customers, 3 per cent. more than the year previous, and there was a gain of 4 per cent. in the number of steam heat consumers, which now total 305.

Baltimore's Industrial Contracts Will Produce Big Revenue

New industrial contracts made by the power and fuel department of the Consolidated Gas, Electric Light & Power Company of Baltimore during the month of November will produce an estimated annual revenue of $27,125.

The gain in industrial business by the Baltimore company since June 30, 1916, the beginning of the current fiscal year, will produce it is estimated, an annual revenue of $218,667.

Sausalito, Cal., May Now Get Gas

Authority to install a gas manufacturing and distributing system in Sausalito was recently asked of the Railroad Commission by George L. Fish. Sausalito has no gas supply. Mr. Fish filed with the commission the copy of an agreement made on June 7, 1916, with Sausalito which gives him the franchise for ten years and provides that at the end of ten years he shall have received in net revenue from the gas produced and sold to Sausalito people the total cost of installation and 7 per cent. interest. He must not charge more than $1 per thousand feet.

Rate Increase by West Virginia Company

Notice was served on the City of Ironton, O., and other big consumers of gas in the city to-day by the United Fuel & Gas Company, of Charleston, W. Va., which supplies this city with gas, of an increase in the gas rates to industrial consumers effective Feb. 1. The new rate adds two cents per thousand cubic feet to the cost of gas and in per cent. is about seven and one half.

The new rate as furnished the city is 26 cents for the first 1,000 cu. ft.: 21 cents for the second thousand and 19 cents for each other thousand cubic feet used. The old scale was 26, 19 and 14 cents. Previous to the last increase the rate was 28, 16 and 9 cents. The average gas bill of the Ironton City Water Works plant according to city auditor P. W. Dean is around $420 per month and the new rate will add around $30 to this amount each month.

Richmond, Va., to Merge Clerical Forces of Gas and Water Departments

Consolidation of the clerical forces of the water and gas departments was practically decided upon by the administrative board in executive session recently.

There has been insistent demand for more help in the clerical departments, as neither has been enlarged since annexation and the work has increased greatly.

The board instructed the city attorney to draft an ordinance providing for the consolidation. The heads of departments are not affected, the consolidation affecting only clerks and inspectors.

Under the contemplated new arrangement, water and gas bills will be made out monthly instead of quarterly, and both items will be included in the same bill. Sub-stations in various sections of the city have been established. Arrangements are also being made to make the bills payable at banks in which the city has accounts. The banks will forward the receipted bills to the city treasurer and credit the deposit to the city's account.

Instead of two squads of meter readers, one for the gas and one for the water department, there will be only one under the proposed consolidation. Each meter reader will report for both gas and water meters.

There will be a chief clerk of the consolidated gas and water departments.

Citizens Gas & Electric Company Increase Wages

Manager J. Frank Sweeney of the Citizens Gas & Electric Company's office in Cedar Falls, Ia., announced recently that employees of the company had been granted a five per cent. increase in salary, effective Jan. 1. The high cost of living is assigned as the reason for granting the increased pay. Following is the general manager's statement notifying employees of the raise:

To the Employees:

The ever increasing cost of supplies and commodities is a serious problem to all manufacturing and operating companies. This company also realizes that these high costs are just as serious a problem to its employees and make a heavy burden in securing a living. In spite of this increased cost and the additional burden involved, in order to be of some assistance to the wage earner in his fight for a living, the company has decided to give a five per cent increase in wages, beginning Jan. 1, 1917.

Reduction by Leominster, Mass., Company

The Leominster Gas Light Company has announced a reduction to the consumers in Leominster and Lunenberg, Mass., of 5 cents per 1,000 feet as the maximum net price, which went into effect Jan. 1.

Austrian Government Limits Illumination

Owing to the shortage of coal the Austrian government has ordered all shops to be closed at 7 p. m., and restaurants and cafes at 11 p. m. The latter have been keeping open until 1 a. m. All electric and gas in the front of buildings are also prohibited, while the illumination of shop windows must be reduced one-third. An encircling gloom is likely to pervade the cities of the empire under those circumstances.

New Rates at Fort Wayne, Ind. Now in Effect

A new scale of rates which means much to the heavy consumers of gas, announced by S. E. Mulholland of the Northern Indiana Gas & Electric Company, went into effect at the beginning of the year. The new rates will affect all the business houses, as well as private residences, where the consumption of gas is more than 10,000 cu. ft. per month. The new rates are as follows: First 100,000 cu. ft. at 85 cents per 1,000; next 20,000 cu. ft. at 80 cents per 1,000; next 20,000 cu. ft. at 70 cents per 1,000; next 100,000 cu. ft. at 60 cents per 1,000; next 350,000 cu. ft. at 50 cents per 1,000; over 500,000 cu. ft. at 45 cents per 1,000.

Gas-Piped Blocks at Lexington and Arlington

The Arlington, Mass., Gas Light Company believes in reciprocity. Its subsidiary, the Lexington Gas Company, has just established itself in a new office in that historic town. The block in which its office is located is a new building. Before signing the lease, it was stipulated that the building should be piped for gas, and the provision has been met.

Recently a block of stores under construction at Arlington yielded an order for 76 lighting outlets. The manager, Mr. F. A. Woodhead, was not satisfied with having gas lighting confined to the interior, i.e., "hiding his light under a bushel," hence he induced the owners of the building to install eight gas arcs on the interior, the equipment being furnished on the lease plan. Tenants will enjoy the benefit of these lamps by paying 35 cents a month.

Bill Filed Fixing Gas Price and Dividend

A bill has been filed in the Massachusetts Legislature which aims to provide that after July 1, 1917, the standard price charged for gas supplied by the Boston Consolidated Gas Company shall be 70 cents per 1,000 cu. ft., and that the standard rate of dividend to be paid by that company shall be 7 per cent. per annum. Representative L. R. Sullivan is the author of the bill.

Massachusetts Companies Ordered to File Managerial Contracts

The gas and electric light commissioners have issued an order to 67 electric light companies and 50 gas companies in Massachusetts instructing them to file with the board before Jan. 15, 1917, copies of all contracts in force with any engineering or management corporation.

The order reads as follows:

"The board directs that you file in this office on or before Jan. 15, 1917, copies of all contracts in force with any management or engineering company, association or corporation for managerial services or for construction and engineering services or supervision. If said contracts are in the form of votes by directors or stockholders, file attested copies of the records of the meeting at which said votes and acceptances were passed."

Personal Notes

CHARLES MORRISCH of Brazil, Ind., will personally manage the Rochester (N. Y.) Light, Heat & Power Company, taking the place of John H. Sonntag, who relinquishes his interest in the concern to re-enter the bond business in Chicago, Ill.

GARDNER ROGERS, who for the past seven years has been president of the Houghton Traction Company and the Houghton County Electric Company at Houghton, Mich., has been appointed general manager of the Woonsocket branch of the Blackstone Valley Gas & Electric Company.

LEE BENOIST, vice-president of the American Cities Company is to become president of the New Orleans Gas Company according to an announcement made by D. D. Curran, president of the New Orleans Railway & Light Company, at the recent annual meeting of the gas company.

THE GOODMAN CONSTRACTING COMPANY (Safety Gas Main Stopper Company), has announced the removal of its offices to 90 Alexander Avenue near 133rd Street, Borough of the Bronx, New York.

JOSEPH M. NELSON has been appointed superintendent of the People's Lighting, Heating & Power Company, Barre, Vt., succeeding Mr. Luther M. Pease, who has been superintendent for the past three years. Mr. Pease recently was appointed first assistant to Manager Snow of the New Bedford (Mass.) Gas & Edison Light Company.

W. A. LEUENBERGER, superintendent of the Tacoma Gas Company, Tacoma, Wash., has been elected president of the Tacoma Safety Council.

R. C. COFFY, manager of the Everett Gas Company, has been appointed chairman of the Civic Bureau of the Everett Commercial Club.

Personal Notes—Continued

J. F. MAGUIRE, manager Northern States Power Company, Minot, N. D., has been appointed chairman of the Organization Committee of the Minot Association of Commerce.

A. L. MARTIN, manager of the Oregon Power Company, Marshfield, Oregon, division, has been appointed vice-president of the Coos County Good Roads Association.

Construction Notes

Rock Island, Ill., Improvements —Completed and Planned

The expenditures of the Peoples Power Company for construction in Rock Island, Ill., alone during 1916 were approximately $50,000.

In the gas department approximately four miles of mains of different sizes were laid. Included in this was a little less than a mile of high pressure main extending west on Third avenue to Eleventh Street and south on Eleventh Street to Tenth Avenue. A governor house will be erected at the back of the lot on the south-east corner as soon as possible. This house will contain a governor which will equalize the pressure on the whole south-west section of the city and prevent variations in pressure.

The records show that over half of the meters of Rock Island were changed during the year, indicating that an average of one out of every two of the families in town moved once.

The work of removing prepay meters with a view of eliminating the danger from explosions caused by thieves breaking into the gas chamber while attempting to get the money from the money box has gone on and 1,300 prepay attachments valued at $5,000 have been scrapped.

The work for the coming year is now being laid out. All of the dead ends on the gas distribution system will be tied together to give uniform pressure.

Ottumwa, Ia., Has Had Busy Construction Year

Approximately nine miles of gas mains were laid in Ottumwa, Ia., during the year 1916 by the Ottumwa Gas Company.

Two-thirds of this pipe was put down for the betterment of the service to present consumers. Of the other piping, most of it was laid down in Fairview addition, this being the longest single extension of the year. Residents of this section of the city now have both water and gas.

Improvements amounting to $15,000 were made to the plant and extensions and house connections cost $30,000. About one-half of this figure was spent for labor.

1,000,000 Cu. Ft. Holder To Be Constructed at El Paso, Texas

The Stacey Brothers Gas Construction Company of Cincinnati, O., has secured a contract for a 1,000,000 cu. ft. holder for the El Paso Gas Company at El Paso, Tex. Erection will probably be started within 90 days, and the work is to be completed by Oct. 1. William S. Guitteau, sales manager of the Stacey Brothers Company made the sale.

To Better Service at El Dorado, Kan.

The Empire Gas & Fuel Company of Kansas, announces that they will spend $17,000 in El Dorado in the next few months in the bettering of their gas service. New service lines will be run from the oil fields to supply the north part of the city and the present output of the lines will supply the southern part of town. Incidentally, many other improvements, totaling an expenditure of over a million dollars, are in prospect, including a $50,000 machine shop, a $100,000 business building, a $65,000 hotel building, a $25,000 high school addition, a $50,000 water extension and two $50,000 apartment houses.

Societies and Associations

THE SOCIETY OF GAS ENGINEERING of New York City will hold its supper dance at the Hotel Biltmore, Madison Avenue and Forty-third Street, New York City, at 9 p. m., Friday, Jan. 19.

The December meeting of the NEW ENGLAND SECTION OF THE NATIONAL COMMERCIAL GAS ASSOCIATION was held as a joint meeting with the NEW ENGLAND SECTION OF THE ILLUMINATING ENGINEERING SOCIETY, at the Boston City Club, Friday, Dec. 22.

President George P. Smith, of the N. C. G. A. section called the meeting to order and introduced Chairman Rogers of the Illuminating Engineering Society section, to whom he handed the gavel. Mr. Rogers introduced the speaker of the evening, C. O. Bond, manager of the Physical Laboratories of the United Gas Improvement Company, of Philadelphia and past president of the Illuminating Engineering Society. Mr. Bond on commencing an informal talk on Gas Lighting said that when Mr. Smith asked him to address the meeting he required that the speaker be one who firmly believed in the present and future of gas lighting and of illuminating engineering. Some of the reasons for firmly believing in gas lighting were because of its great dependability in that there were no exposed conductors to suffer at the whim of every severe storm; its low intrinsic brilliancy, (good light, yet with eye comfort); its steady light without flickering as found in its competitors. The older type—open flame gas lighting also exhibited the lambency effect so pleasing to all of us, such as that of the cheerful open fire.

Standard gas conditions and standard appliances were one of the industry's great needs for successful gas lighting. The report of the studies of the committee of the Gas Institute convention shows us that mantles are nearing a standard. But gas conditions vary greatly from day to day and even from hour to hour. A light adjusted for the pressure conditions of the moment might in a few hours either backfire or carbonize the mantles—and that through no fault of the manufacturer of the appliances or of the maintenance man. The electrical industry has been spending a great deal of effort in standardization of appliances and of electrical service. All that is needed to change any light in the home is to unscrew one lamp and twist in the other. Just such an appliance is needed for our industry. When we have the units and have educated the housewife to take care of them, we will find conditions much more favorable.

For a number of years the cities of Europe have been successfully lighting their streets with pressure gas lamps controlled with wave pressure devices so they are lighted and extinguished from one place rather than from lamp to lamp. Our gas conditions are different from those in Europe and we have not been successful in our adoption of them. But with the study and standardization of gas conditions we should develop our street lighting by the aid of similar devices. How many of our gas companies analyze their complaints and find the greater part of the lighting complaints are due to lack of standardized gas conditions? Our pilot troubles, our carbonized mantles, our improperly adjusted lamps—yes, even most of the broken mantles and glassware—all are caused by gas changes.

Mr. Serrill of Philadelphia, President of the Illuminating Engineering Society, gave a good resume of the work of the Illuminating Engineering Society. He told of the benefit to be had in the study of Illumination.

Mr. Wrightington, vice-president of the Boston Consolidated Gas Company, opened the discussion of Mr. Bond's talk and was followed by C. D. Bond (Weymouth) and D. F. Condrick of Hingham, M. B. Webber (of Webber Syndicate, Boston), Prof. Hudson of Mass. Institute of Technology, Mr. Vogkley of the Boston Consolidated Gas Company, Geo. P. Smith, Jr. (Braintree), Mr. Halverson of the General Electric Company and many others. The discussion brought out many interesting points among them Mr. C. O. Bond's ideas of women on maintenance work.

The next meeting of the N. C. G. A., N. E. Section will be held Friday, Jan. 26, at the Boston City Club. Tulley Wilson of New York will talk on "Combustion and Ventilation as an Aid to Gas Merchandising."